THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 79: No. 7. New York, Thursday, February 14, 1907.

$5.00 a Year, including Postage. Single Copies, 15 Cents.

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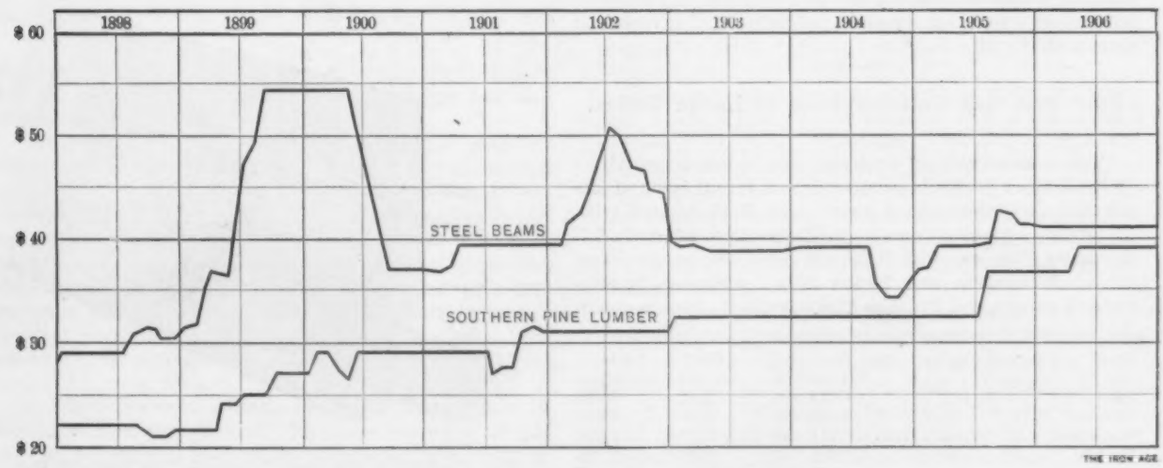
THE IRON AGE

New York, Thursday, February 14, 1907.

Steel versus Wood.

Prices of Steel Beams and Southern Pine Compared.

The curves plotted in the accompanying diagram show the fluctuations in the prices of steel beams and Southern pine timber over a period of years. They bring out strongly the advance in the price of lumber, its resistance to unfavorable conditions of business and its quick response to favorable conditions. They demonstrate that already steel is cheaper than wood for structural purposes where heavy loads must be sustained, and that if the constant, never receding advance of pine is to continue, as lumbermen confidently predict it must, the time is not far distant when steel will be the cheaper for all buildings requiring the strength that makes desirable the use of one or the other of the two materials. Reinforced concrete must be given an important place in connection with this class of construction, but the experience of those who have used it has varied so materially as to cost and its use is so comparatively young, that the price of steel beams is the better as a basis of comparison with the timber.



Prices of Steel Beams and Southern Pine Compared.

The two curves are, strictly speaking, relative. That of beams, based on Philadelphia quotations, is taken from the diagram published in *The Iron Age* of January 10, showing the fluctuations of prices of crude and finished iron and steel. The price of Southern pine is plotted from the "general run of the yard" price, wholesale, at Boston, Mass., compiled from weekly quotations. The one price is cost per ton, the other cost per 1000 ft. The run of the yard price means that of timber large and small. The larger sizes bring the greater money per 1000 ft. If data could be procured to plot a curve of the price of some one heavy size of timber, the extremes between the two ends of the curve would be even more marked, for the larger sizes have advanced more rapidly than the smaller, as must be the case in the face of a dwindling supply and a growing demand. For the general comparison of the two materials, timber and steel, the prices used in the curves afford the fairer basis. In a sense, the prices of other kinds of lumber have followed that of Southern pine, but the average increase has not been fully as marked.

Lumber Steadily Growing Dearer.

The importance of lumber in most industries is such that prevailing high prices have become a material factor of cost. It is a great question, with many sides and influenced by conditions which change greatly from year to year, as forests become depleted and one variety of wood replaces another in every day use. In a general way it may be stated that lumber of all descriptions must steadily become more expensive, although the future promises some important changes in market supplies. The completion of the Panama Canal will bring the Oregon and other Pacific Coast timber closer to the markets of the middle and Eastern parts of the country. Perhaps a change in tariff relations with Canada may result in timber being admitted free of duty from our Northern neighbor. But such changes are not in the immediate future. When Oregon pine can be shipped to the Atlantic and Gulf States and through the great waterways of the Middle States, it will put Southern pine on the basis of competition and should prevent a further rise. But the price when those conditions arrive will be higher than it is to-day.

Southern pine presents one of the most serious of the lumber problems, especially in its larger sizes, such as are used in structural work. The steadiness of its advance demonstrates this. No descending step has been taken. The curves show that the fluctuations of steel have not been followed, except upward. No response comes to a decline in steel. This is because Southern pine is governed rather more by supply than by demand. Lumber interests no doubt influence these prices, but such influence would probably not be so potent were it not for the manner in which the sources of supply are disappearing before the axe of the lumberman.

Practical Working Comparisons.

Two problems have been worked out to show with some degree of exactness the relations between the cost of steel and Southern pine for structural purposes, demonstrating the fact that for heavy loads steel is the cheaper, while timber still has the advantage for lighter loads. The results also prove that timber has to advance comparatively little more to make steel cheaper for even light loads, and lumbermen believe that prices will be at that point at no very distant day. They maintain that the field of usefulness of this class of lumber is so wide that even with steel the cheaper the demand would still be great enough to maintain the ascending curve of price.

For one problem, a bay of a factory building 10 ft. between beams and 20 ft. span was taken, giving an area of 200 sq. ft. to be supported by a beam, either of steel or Southern pine. For the sake of convenience a standard 20-in. 65-lb. beam was taken as the basis, supporting a superimposed load of 313 lb. per sq. ft., making a total of 31.19 tons for the given area. The cost of the steel based on the figures for December, 1906, punched, cut and framed, erected and painted, was 3 cents a foot, being the

actual figured price on a building in a New England city 40 miles from tidewater. The cost of the beam was $39.

To support the same load with Southern pine, under identical conditions, requires the equivalent of a timber 16 in. deep and 28 in. wide, which means two 14 x 16 in. girders. Figuring the cost of this lumber in the same city, at the same time, on the basis of $45 per 1000 ft. for the wood in the yard (none too great a figure considering the dimensions), means $55 per 1000 ft. erected, or $41.03 for the equivalent of the steel. Thus the steel has more than $2 the better in the comparison.

Taking the same distance between posts and the same span, but reducing the load to that of the next smaller standard size of steel beam, 15 in. 42 lb. supporting 157 lb. per sq. ft., it is found that the cost of the steel is $25.20, as compared to the $20.52 for the equivalent timber—a 14 x 16 in. girder.

In October and November, 1904, steel beams dropped to a point where they were cheaper than Southern pine, in about the same ratio as that of to-day, for heavy loads. The market was depressed, while timber remained stationary. When steel drops again, if timber retains its present tendency to maintain its price regardless of general conditions, the advantage will be even more marked than now, especially if pine shall have continued its step-like progress upward. Taking everything into consideration, including the expert opinion of men well informed in the lumber business, there would seem to be little doubt that the tendency will constantly increase to substitute steel for mill construction, not only because of the merit of steel as a building material but because of a lessening comparative cost.

Coal and Gas Consumption of Large Cities.

The consumption of coal and gas in the larger cities of the United States is compared in a recent issue of the *Stevens' Indicator*, which shows New York to lead with an annual consumption of 12,500,000 tons of coal, followed by Chicago, with 8,245,000 tons. As to gas, New York (Manhattan and Bronx only) consumes 21,000,000,000 cu. ft., and Chicago 12,000,000,000. The per capita consumption for six cities was given as follows:

City.	Population.	Coal, net tons.	Gas, cubic feet.
New York	4,014,000	3.12	8,800
Chicago	2,020,000	4.00	5,940
St. Louis	714,600	7.55	5,600
Boston	602,500	6.70	5,120
Cleveland	465,000	5.43	3,230
Cincinnati	425,000	8.20	5,180
Average	1,374,000	4.42	7,017

Of the total coal burned in these six cities, aggregating 36,428,000 tons, no less than 23,588,000 was bituminous, while the anthracite amounted to 12,840,000 tons (2000 lb. each). The anthracite percentage was about 35. In the several cities the anthracite percentages were as follows: New York, 72; Chicago, 17; St. Louis, 3; Boston, 45; Cleveland, 13; Cincinnati, 1. Compared with the bituminous tonnage used in New York, 3,500,000 tons, Cincinnati used almost identically the same; St. Louis, 50 per cent. more, and Chicago, 95 per cent. more. The low consumption of coal in New York, per capita, with correspondingly high consumption of gas, is accounted for partly by congested population, which tends to increase the number of apartment houses and hotels, where many families are supplied with heat from a single central plant, and where a large share of the cooking is done by gas ranges, and partly because the city is so pre-eminently a commercial one, rather than strictly a manufacturing community, as is so largely the case with the others.

On December 31, 1906, Canada had 15 completed blast furnaces, of which eight were in blast and seven were idle. Of the total, 12 usually use coke for fuel and three use charcoal. In addition one furnace, to use coke, was being built and three coke furnaces were partly erected on December 31. Work on the partly erected furnaces was suspended some time ago.

Irwin Skylight Construction.

There is a detail in factory construction that is invariably more or less trouble to dispose of satisfactorily—the skylights. The general problem of size and placing peculiar to each situation is expected and may ordinarily be worked out with little difficulty, but experience has taught that, unless all manner of precautions are taken, the installation will later develop annoying disadvantages. A large area of glass has immense possibilities for causing condensation if the air within the building is materially laden with moisture, and drippings from the lights are not only likely to prove a discomfort, but a source of injury to machinery or product. Again, the large areas of glass are subject to extreme changes of temperature, not simply with the seasons, but through every 24 hr. The unequal expansion and contraction of the glass and metal frame make it difficult to maintain joints sufficiently tight to exclude the elements without endangering the glass to cracking. The peculiarities of glass cannot be changed, therefore the only means of overcoming the troubles is in the frame which supports it. It is here that various manufacturers have devoted their energies to perfect schemes that will prove permanently successful. Quite a number are already on the market and not a few of them are being received with favor. The illustrations herewith and the following description pertain to constructions that are put out by the Thos. W. Irwin Mfg. Company, Allegheny, Pa.:

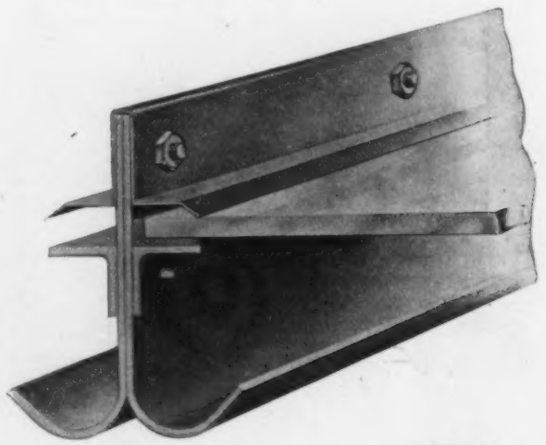


Fig. 1.—Irwin's Improved Structural Iron Skylight Bar.

A first principle in the Irwin system is the adherence to standard gauges and templates for all parts, which means much in the obtaining of watertight, secure and compact structures. Various designs are manufactured to meet the widely different requirements that will be met with in various situations. In general the aim is to provide simple construction and material which will be light, strong and durable. There are three distinct styles of skylight—the comb, hipp and flat—which may be divided into a great number of shapes, adapted to almost every circumstance. In one form the Irwin skylights are made in what is known as flat or drop in skylights, a construction without curbs or valleys, always permitting water to pass over the glass with its accompanying cleansing effect. When great lengths of buildings are to be equipped this style of light is preferable, as it will admit of unlimited extension. Another aim is to provide fireproof construction, for which reasons the materials of the frames are entirely of metal to make the construction fire and water resisting.

The two points most frequently in dispute among skylight makers are the form of condensation gutters and method of securing the glass. Those which are advocated by this company are based on an experience of some 35 years and are claimed to be giving universal satisfaction. The improved form of the Irwin construction extends the gutter just outside of the glass rest, to prevent the condensation from escaping any other way than

through the proper channels. Provision is made for carrying off the condensation from the inside.

It has been contended by some that puttyless skylights are superior to all others. The Irwin Company takes the opposite position, asserting that the majority of puttyless skylights reserve only a space of ⅛ in. for a glass rest, and that there is not one sheet of glass in a hundred that is perfectly level, all being inclined to be

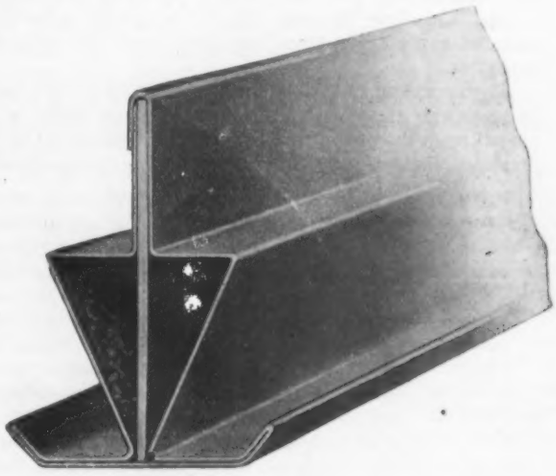


Fig. 2.—The Carnegie Bar in Galvanized Iron with a Core Plate.

wavy in form. For these reasons it is considered best to bed the glass in putty to provide a safe, proper and efficient water tight rest.

Aside from the proper imbedding of the glass to eliminate strain and breakage, another special feature in the Irwin system is the allowance made for the expansion and contraction of the metal. The glass is cut small enough to give sufficient play between the upper ridges at the bars and prevent conflict during expansion and contraction. The joints are then covered with copper caps secured to the upper ridges. This insures a constant covering for the joints, and at the same time allows a free movement during expansion and contraction.

In Fig. 1 is shown what is called the Irwin improved structural iron skylight bar. The bars are made of No. 14 open hearth full cold rolled reannealed iron, with ¾

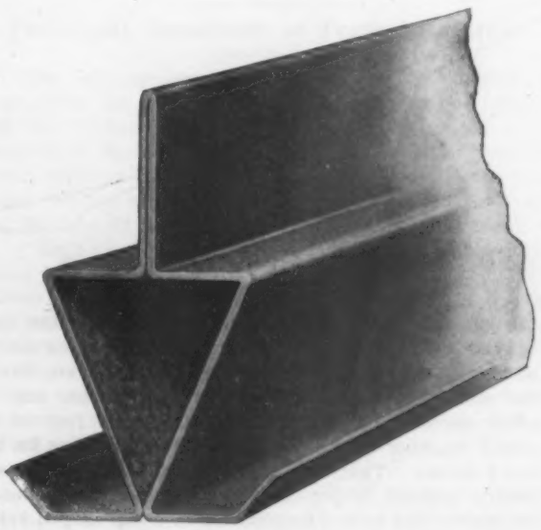


Fig. 3.—The Midvale Bar, Made of No. 18 Galvanized Iron.

x ¾ x ⅛ in. angles, securely riveted to them, upon the glass rests, well bedded in pure putty. The large condensation gutters, which project well past the glass line, do not, however, cut off any of the light. The caps, curbs and cross bars are made of 16-oz. cold rolled copper or galvanized iron, and brass bolts are used exclusively throughout the construction. On sizes up to 12 ft. an intermediate purlin is not necessary.

A second form of bar, shown in Fig. 2, is used in Irwin's improved copper skylight, and has been given the name of the Carnegie bar from its use in the Carnegie Library, Pittsburgh, Pa., where over 143,000 sq. ft. of skylight area was constructed. The bar is made in 16-oz. cold rolled copper, with a ⅛-in. core plate of black iron in the center. The caps, combs and cross bars are also copper. When desired the Carnegie bar is also furnished in No. 24 galvanized iron, strengthened with a core plate of black iron, this bar being designed for use when purlins are spaced 8 ft. apart or more. A cheaper construction is obtained with the same style of bar omitting the core plate. This style can be used on spans of 8 or 9 ft. without the introduction of intermediate purlins.

A third form of bar is shown in Fig. 3, this being known as the Midvale bar from its use in skylight construction for the Midvale Steel Company, Nicetown, Philadelphia, Pa. It is made of No. 18 galvanized iron, and is designed for use in 10 to 12 ft. lengths without the addition of intermediate purlins. A very similar bar is made of No. 24 or No. 26 galvanized iron, and is considered an improvement on the old construction manufactured by many in the trade. A notable feature is the extension of the condensation gutters beyond the line of the glass rest, which prevents any leak from the condensation flowing toward the bar when the roof lines are out of level. Two other cheaper forms of bars not illustrated, but which have been manufactured by the company for some years, are intended only where a cheap bar is desired.

In general the company carries three kinds of glass—rough, ribbed and wire—the selection in any special situation being left to the purchaser. The ribbed glass has an advantage in diffusing the light, and the wire glass guards against the falling of pieces in the event of the glass becoming broken. This is particularly an advantage where fireproof construction is sought in that it helps to resist the advance of a fire through the skylight openings.

Notable among the buildings or plants using the Irwin skylights, other than those already mentioned, are the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company of East Pittsburgh, in the first of which 125,642 ft. is used, and the second 75,000 sq. ft.; the Lorain Steel Company, Johnstown, Pa., using a total of 6348 sq. ft.; the Colorado Fuel & Iron Company, Pueblo, Colo., having 50,000 sq. ft. of Irwin skylight; the Allis-Chalmers Company's West Allis Works, Wisconsin, 80,000 sq. ft.; the Baltimore Railway Specialty Company, Corning, N. Y., 3967 sq. ft.; the train shed of the P. & L. E. R. R., Pittsburgh, Pa., 54,000 sq. ft., and the Baltimore & Ohio Railroad roundhouse at Glenwood, Pa., having 6606 sq. ft. of Irwin skylight.

Figures for a Turbine Steamship Plant.—Assuming the steam consumption of the turbines of the new Cunard steamship Lusitania to average 15 lb. per horsepower-hour when the turbines are developing 65,000 hp., it has been calculated that the boilers will have to evaporate each hour 435 tons of water, which would call for the consumption of 50 tons of coal per hour, or 1200 tons per day. As the turbine requires for economical working a high vacuum it is assumed that the condensers will call for about 50 lb. of circulating water for each pound of steam condensed. This means an hourly passage of 21,750 tons through the circulating pumps, or 522,000 tons per day. Each pound of coal consumed will require the passage through the furnaces of 14 lb. of air making a total of 700 tons per hour, or 16,800 tons per day. This is equivalent to 21,000,000 cu. ft. of free air per hour. With the average trip estimated at five days it will be seen that the coal assumed will amount to 6000 tons. The water evaporated will total 52,200 tons. The work of the circulating pumps will be represented by the passage through the condensers of 2,610,000 tons of water, or 60 times the entire weight of the ship and contents. The air requirements of the furnaces will amount to 84,000 tons.

Fairbanks-Morse Pneumatic Hammers.

A pneumatic hammer has recently been perfected and patented by Fairbanks, Morse & Co., Chicago, Ill., as a result of what this company believes to be the most thorough and systematic series of experiments of its kind ever conducted. A testing machine was invented and built for the purpose of producing an accurate diagram showing the velocity of the piston at all points in its travel, the location of the piston and valve at the time of recoil in the hammer, the number of blows per minute, the force of each blow in foot pounds and the consumption of air at any given pressure. In connection with these experiments hammers of every make obtainable were tested and their peculiarities in regard to valve action, striking power and recoil were noted, and with this data at hand the hammers herewith illustrated were designed. Fig. 1 is a section of a 1 1-16 x 9 in. riveting hammer and Fig. 2 a section of a 1 1-16 x 3 in. chipping hammer.

It was plainly brought out in the tests that to insure reliability the valve action must be positive, quick and properly timed, and to be efficient and have good striking powers the ports and air passages should be as large and direct as possible, one good sized port being preferable to a number of smaller ones of even greater aggregate area. To insure positive valve action the valve must be operated in both directions by live air through the medium of large pressure areas. To obtain quick action and avoid rapid deterioration of the valve and seats, due to hammering, the valve must be light and have as short a travel as possible. It was, therefore, obvious that a hollow cylindrical valve of large diameter was the form best adapted to give these results without sacrificing port areas. A slight departure from the usual form of this type of valve has been made by closing the bore of the valve by a solid wall, which permits the use of pressure areas equal to the area of the space occupied by the valve, and makes the valve much more rigid than the usual hollow cylinder valve. The hammer is notable in the extent to which efficiency and reliability have been considered in design, as well as its adaptability to the most improved modern methods of manufacturing. From a careful study of this design it will be seen that, with the exception of the cast steel handle and the trigger, which is a drop forging, the parts are all admirably adapted to be made from long stock steel on automatic machines.

It was shown in the tests conducted that with a quick and properly timed valve the fluid pressure could be removed from the piston in time to prevent the recoil of the piston on impact with the tool from being transmitted to the hammer and without materially affecting the force of the blow. But there still remained two other sources of recoil, viz., the one produced by the piston, due to the velocity obtained on its rearward stroke, and the other caused by admitting live air to the rear of the piston chamber before the piston had started on its forward stroke. That resulting from the first cause was greatly reduced by providing a long dead air cushion at the rear of the barrel, terminating in a cup shaped valve; the second, by admitting live air in gradually increasing quantities at the rear of the piston until it had attained some velocity before admitting air to the full capacity of the valve. This is accomplished by the slight taper bore of the valve, which, as the piston emerges from its forward stroke, provides an annular opening of gradually increasing area, through which live air is admitted to the rear of the piston.

The effect of these features on the handling qualities

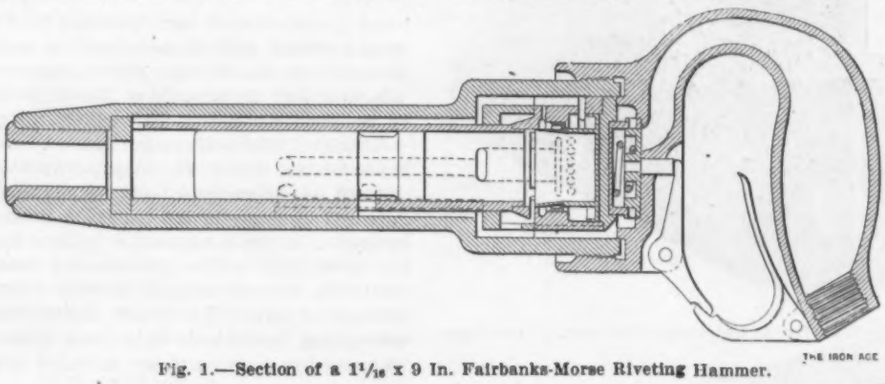


Fig. 1.—Section of a $1^1/_{16}$ x 9 In. Fairbanks-Morse Riveting Hammer.

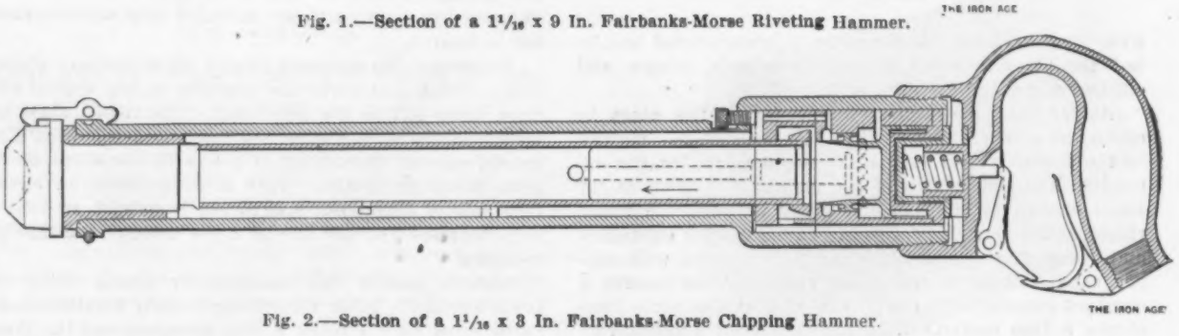


Fig. 2.—Section of a $1^1/_{16}$ x 3 In. Fairbanks-Morse Chipping Hammer.

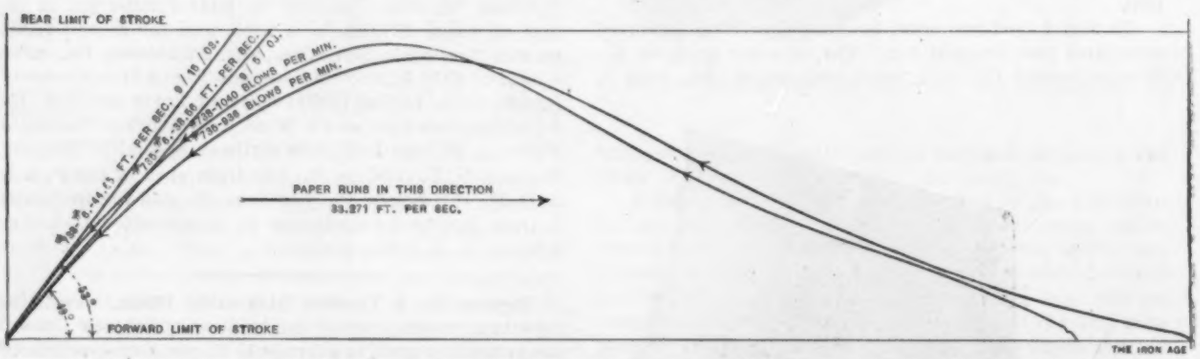


Fig. 3.—A Section from the Autographic Testing Machine Record Comparing the Performance of Two Hammers.

of the hammer is quite remarkable. To still further place these qualities in control of the operator a new feature has been added—a small hand valve, which can be set to control the live air passage to the forward end of the piston chamber, thereby controlling the amount of air admitted to return the piston, and consequently, the velocity of the piston on its return stroke. By this means, when using the hammer on overhead work and in other inconvenient positions the recoil can be still further reduced at a slight sacrifice in number of blows per minute without affecting the force of the blows delivered. On the other hand, when air at lower than ordinary pressures is used, or the work requires a maximum capacity of the hammer, the number of blows can be greatly increased, though not without a corresponding increase of recoiling.

In the construction of this hammer a departure has been made from the usual practice in that, instead of making the barrel in one piece and drilling the ports and passages, it is made of two hollow cylinders, one of which is pressed into the other. All air passages are milled on the outer surface of the inside cylinder and ports are cut through. This eliminates long drilled holes of small diameter and the necessity of plugging the open ends. By a simple and inexpensive process the outside surface of the barrel is casehardened to protect it from nicks and blows in handling, and the inner surface of the bushing is casehardened to a depth of about 1-16 in. and ground. This not only lengthens the life of the barrel, but greatly reduces the friction between the barrel and piston, thereby increasing the striking force and efficiency of the hammer. Tests have shown gains of as high as 10 per cent. in piston velocity in hardened and ground barrels, as compared with soft reamed barrels. It has also been found that in hammers which have been in constant use for over three years practically no wear can be detected, the grinder marks being still in evidence, which means that with ordinary care these barrels should last a lifetime.

The diagram shown in Fig. 3 illustrates the method of recording the action of a hammer piston, and shows one step in the process of perfecting this hammer. It will be noticed in the case of hammer No. 735 the piston did not start back promptly after impact with the tool and did not complete its rearward stroke—features which would never have been detected without the testing machine. Slight changes in valve timing and ports produce the results shown in the case of hammer No. 738—an increase of 104 blows per minute and an increase of over 15 per cent. in piston velocity at impact.

The Right Treatment of Trade Literature.

The commendable manner in which catalogues, pamphlets, &c., received from other concerns are handled by the Crocker-Wheeler Company, Ampere, N. J., is described in the following extract from a letter received from Rodman Gilder, the publicity manager of the company, written after reading the editorial in *The Iron Age* of January 31 on "The Abuse of Trade Literature."

"Each piece of printed matter addressed to this company is placed on the desk of the writer, and is by him either destroyed, if worthless, or distributed to the department that might be interested in it to the extent of placing it on file. We find that this works satisfactorily as one of our methods of keeping the various departments posted, and also gives the writer the benefit of seeing what other manufacturers are doing in the line of direct advertising."

A Remarkable Gun Test.—Tests made at Sandy Hook of a wire wound Brown gun have developed very high muzzle velocities, accompanied by correspondingly high chamber pressures, but without serious strain on the gun, due to its specially strong construction. The gun has a 6-in. bore, is 50 calibers long (25 ft.) and uses a projectile weighing 106 lb. With a powder charge of 73 lb. a muzzle velocity was obtained of 3470 ft. per second, with a chamber pressure of 48,672 lb. (21.7 tons) per square inch. By increasing the charge to 84 lb. the velocity was raised to 3740 ft. per second, by accepting an increase in the pressure to 64,483 lb. (28.7 tons) per square inch. These two pressures correspond respectively with 3310 and 4380 atmospheres. The result first mentioned represented 8615 ft.-tons of muzzle energy, or 118 per pound of powder used. The muzzle energy corresponding with the velocity of 3740 ft. per second is 10,295 ft.-tons, or 122.5 per pound of powder in the charge. The present naval 6-in. 50-caliber gun shows a muzzle velocity of 2900 ft. per second, corresponding with an energy of 5838 ft.-tons. The weight of the gun is about the same. It is said that the erosion was not excessive. The trajectory, of course, was very flat with such high velocities. The gun was fired out to sea with an elevation of only 1½ degrees, and the shell did not strike the water until it had reached a distance of about 3 miles. The second ricochet was so far out to sea that it could not be observed with glasses.

Niagara Power Distribution.

To acquaint the public with the availability of electric power from Niagara Falls, the Ontario Power Company, Niagara Falls, N. Y., is distributing a series of five maps showing its power districts. Map No. 1 covers the power district between Syracuse, N. Y., and Hamilton, Ont., and shows the transmission lines, finished and proposed, of the Niagara, Lockport & Ontario Power Company and the Ontario Transmission Company, Limited. Incidentally, it also shows the steam and electric railroads, finished and proposed, and the location of transformer stations. Map No. 2, of eastern Ontario and western New York, is a general map of the Niagara frontier, and shows the transmission lines of the same two companies before mentioned, and canals, steam roads, electric railroads, &c. Map No. 3 is of the power district in the vicinity of the Welland Canal, showing in general the same matters of interest. Map No. 4 is a larger scale map of Niagara Falls and vicinity, showing the land of the Ontario Power Company of Niagara Falls, the Ontario Transmission Company, Limited, the Niagara, Lockport & Ontario Power Company, the North End Land Company of Niagara Falls, North End Land Company, branch of the New York Central & Hudson River Railroad, lands of steam railroads and steam and electric railroad lines, as well as highways and streets. Map No. 5 is of the Buffalo, Depew and West Seneca power districts, and shows transmission lines and lands owned by the various companies, and steam and electric railroads, highways and streets. These maps are copyrighted by the Matthews-Northup Company and the J. N. Matthews, Company, Buffalo, N. Y.

The Pittsburgh Coal Company has decided to take over all the preferred stock held by the Pittsburgh Coal Company Employees' Association, which was purchased at prices averaging about $19 a share more than the present market price. The association will, however, be permitted to secure the stock for its members as formerly, but under modified conditions. Through the association the company assisted employees to purchase preferred stock on the instalment plan, hoping thereby to encourage thrift. The association was very profitable to its members from its organization in 1900 to the time when the $7 annual dividend ceased in 1905. According to the last annual report of the association its members had contracted for 9501 shares of stock.

In comparing rates of progress in the boring of large tunnels, it has recently been shown that the Simplon tunnel, 12¼ miles, was constructed at an average of about 28 ft. per day. The Hoosac tunnel, 5 miles, progressed at 5½ ft. per day. The Mont Cenis tunnel, 8 miles, was built at 8 ft. per day. The 4-mile Sutro tunnel was bored at the average rate of 10.2 ft. per day. The Saint Gotthard tunnel, 9¼ miles long, was driven at an average of 14.6 ft. per day, and the Arlberg tunnel, 6⅜ miles, at 27.8 ft. per day. The conditions prevailing in each of the several cases had much to do with the rate of progress achieved, while the state of the art at the time of driving had large influence. Progress was much accelerated upon the Simplon tunnel after power drills were installed.

The Corrosion of Iron and Steel.*

This is a question which has brought forth many opinions, but in most cases with little practical evidence. After investigating closely many cases which have come under my observation during the past two years, where the two materials were put in service together and subject to the same conditions, I have never yet found any decided difference. The impression which exists in some minds that wrought iron pipe is much superior to steel in durability may have originated in comparisons made years ago when the practice of making sound low carbon steel was probably not so well understood as it is to-day, or it may have been a mistaken identity, for we frequently find iron mistaken for steel, especially if it happens for some cause or other to be pitted, but in most cases the idea has apparently been spread by hearsay and accepted without investigation.

In view of the inherent differences between iron and steel made for various uses, it would seem safer to compare each class by itself, *i. e.*, wire, sheet, pipe, &c., each under the conditions of service to which they are subjected. The essential conditions of corrosion—air, water and carbonic acid—are easily duplicated in the laboratory; but in practice corrosion is accelerated by the presence of sulphurous and other solutions, stray electric currents, heat and numerous other influences difficult to trace.

It will be conceded that such conditions tending to seriously affect corrosion are rapidly on the increase, especially in and near the great centers of population. Hence we should be slow to draw conclusions from the statement that steel does not last nowadays as it did 15 or 20 years ago. Whatever was the relative standing of the two materials years ago (and opinions differ widely) what we are more concerned with is how do they stand to-day, and how can they be best protected from corrosion? Laboratory results, while open to criticism as not truly representing actual conditions in the field, are valuable as indicating the relative standing of a number of samples under conditions known to be uniform—something difficult to be sure of in service tests. The writer has in his tests lately used a 5 per cent. hot solution of brine through which a continuous flow of air is pumped. One reason for adopting this solution is that a number of tests are on record which indicate that steel in general seems to be somewhat more susceptible to this environment than wrought iron, and further that the loss is quite considerable in a reasonable time (about 1-10 g. per square inch per month). A number of average results on pipe materials are given in the accompanying table, comparison being made with good wrought iron as a standard.

Average Results of Recent Comparative Tests on Corrosion of Wrought Iron and Pipe Steel.

(Losses per unit of surface exposed compared with puddled iron as 100.)

Conditions of test.	Authority.	Duration of test.	Charcoal iron.	Puddled iron.	Pipe steel.	Test started.
1. Aerated distilled water. Normal temperature.	U. S. Navy Departm't.	64 wks.	100	...	94.5	1901
2. Sea water. Normal temperature.	H. M. Howe.	2 yrs.	...	100	119	1897
3. Aerated brine. Normal temperature.	Laboratory Nat'l Tube.	6 mths.	...	100	106	1904
4. Aerated water. 180 degrees F.	Laboratory Nat'l Tube.	3 mths.	...	100	90.6	1905
5. Aerated brine. 180 degrees F.	Laboratory Nat'l Tube.	3 mths.	80	100	75.3	1906
6. Aerated sea water. 180 degrees F.	Howe.	3 mths.	94.4	100	94.2	1906

There are two possible ways of protecting steel: 1, by use of efficient protective coatings; 2, by treatment of the metal in the course of manufacture. Experiments have been under way for some time at the works of the National Tube Company with the object of increasing the durability of pipe steel. As a first step in this direction a process has been developed which after a year and a half's trial has given results showing a decided benefit to the steel, especially in the uniformity with which it corrodes. The treatment consists in a mechanical working or kneading of the metal which tends to produce greater uniformity and to improve the quality and texture of the steel. Doubtless much of the steel does not need this treatment, but in such cases it does no harm, and on the whole raises the average standard of the output. Tests marked Nos. 4, 5 and 6 were made on this steel.

It has been recognized that service tests must be made before any certain conclusion can be reached. A number of such tests have been made on this steel pipe in sulphurous air, salt water and mine water during the past year, precautions being taken to have an equal number of pieces of "genuine" wrought iron pipe alongside under the same conditions. The results so far have shown the steel so treated without exception to be at least the equal of and generally decidedly superior to wrought iron.

Discussion.

S. B. ELY: Regarding the corrosion of iron and steel, I know in the case of sheets that you can find any number of iron roofs in the country that have been in service from 25 to 50 years. I have never been able to find any steel roofs of that kind. And it is pretty good proof that the old iron, whatever it was, seemed to resist corrosion. And I know to-day that, in the case of sheets, steel will not last nearly as long as iron sheets. I have thought that the presence of manganese had something to do with it. While I do not doubt the statements regarding pipe, I would like to know why there is such a difference between pipe and sheets in the rusting qualities.

K. F. STAHL: I have noticed the same in our works, and I claim that manganese is to blame for the corrosion of steel sheets; therefore, I would like to ask Mr. Speller what the percentage of manganese is in his special pipe steel?

F. N. SPELLER: Before answering I would like to ask the gentlemen whether they have ever seen an iron and a steel sheet, unprotected, exposed side by side to the weather?

S. B. ELY: I do not know that I have ever seen them side by side. At the Wood plant at McKeesport are made both iron and steel sheets and the iron will last twice as long as the steel.

F. N. SPELLER: Do they put them in without any protective coating?

S. B. ELY: No.

MANGANESE DOES NOT HASTEN CORROSION.

F. N. SPELLER: That is the point. I believe tests are now being made where the two are exposed unpainted and very little difference is to be seen between the iron and the steel. At the same time some coarse grades of wrought iron roofing sheets appear to outlast steel roofing sheets in service. The explanation seems to be that this wrought iron has a rougher surface than steel, which enables the paint to adhere more tenaciously. The manganese in steel runs 0.3 per cent. I do not believe that has anything to do with corrosion, for we have any number of tests of charcoal iron both in service and in the laboratory which show that it will pit more than pipe steel; and charcoal iron does not carry any manganese. We made a number of tests along that line by tubing one side of a boiler with charcoal iron and the other side with steel. And on the whole we found more cases of pitting among the charcoal iron tubes than the steel. There must be some other explanation for pitting. It is probably more often caused by external influences.

K. F. STAHL: What called my attention to the rapid corrosion of steel was a change we made about 10 years ago. We extended a building and used the old sheets which had been in use for eight or nine years on the side of the old building on the side which we extended. On

* From a paper on "Materials and Properties of Wrought Pipe," read by F. N. Speller of the National Tube Company, Pittsburgh, before the Engineers' Society of Western Pennsylvania, November 20, 1906.

the ends we used new steel sheets; and I found after four or five years the steel sheets were considerably corroded, while the old iron sheets were still good. The steel was not bought painted, but we painted it well ourselves. When we buy corrugated sheets I specify that the manganese shall not be above 0.1 per cent. There are always objections when the specifications go out, but we insist on them and several years ago rejected a whole carload of corrugated iron because the manganese was too high. The sheets we are getting now stand all right. The steel that we were getting in 1895 to 1898 is practically all gone while some of the old iron that has been on at least 15 years is still good.

H. C. CRONEMEYER: This question of the more rapid corrosion of steel than wrought iron is very important in the tin plate industry, too. It is almost universally claimed that the old tin roofing stood three or four times as long as the present roofing tin which is made out of steel. I am not a chemist and I do not know whether it is right or not, but in explanation of that they say that small particles of slag which are not thoroughly worked out in the puddling process protect the iron. I would like to ask Mr. Speller why it is that while you make steel pipe you make the couplings out of iron?

WHY PIPE COUPLINGS ARE IRON.

F. N. SPELLER: The sockets have to be tapped and it is somewhat easier to tap the iron. But the main reason for using wrought iron is that a steel coupling galls the thread on a steel pipe so that it cannot be unscrewed without stripping the threads. It has often been useful to have an iron coupling to refer to in cases of corrosion. The iron, of course, has the advantage in that it is hammered in welding and gets a good deal more work than the pipe material. By comparing the effect on the coupling and the adjoining pipe a practical comparison of the two materials can be made. I have never yet heard of a case where there was very much difference in corrosion, and I have examined a great many.

S. B. ELY: Is there any truth in the statement that slag in iron prevents it rusting? Isn't it possible that pipe has to be made to meet certain physical conditions as to strength, &c., to get which the iron pipe has to be hammered until nearly all the slag is out? Whereas, in the case of a sheet there are no physical conditions of that sort, a good surface being about the only requirement.

L. A. STARRETT: Owing to the larger number of chemical industries, there is a greater percentage of acids, alkalies and other deleterious vapors in the air than there was 10 years ago. Does not that affect the life of tin and sheet iron?

H. C. BABBITT: A prominent tinner in this city only a few weeks ago speaking in regard to the relative merits of tin plate of iron or of steel said that he had to repatch the steel plate three or four times while the iron plate remained good.

F. N. SPELLER: How old were the iron plates?

H. C. BABBITT: In some cases 25 to 40 years.

A POINT IN FAVOR OF STEEL.

K. F. STAHL: That would confirm my point that it is the manganese that is to blame for the corrosion. But after the black eye steel did get I wish to say something in its favor. For the older tank cars made for transporting sulphuric acid, 20 years ago, we used iron. We were at first afraid to change to steel as we did not know much about the action of sulphuric acid on steel. Now we have quite a number of cars with steel tanks that have run probably 12 years, and on examining them I found that the action of the acid on iron tanks, of which we have still a few, was much less uniform than on the steel. That is, there were streaks all through the plate that look somewhat like the corrugated rubber matting on the floor, while the steel tanks wear almost uniformly, and are nearly smooth inside. This confirms the statement as to the steel pipe in mines, that it will stand acid as well or maybe better than iron.

F. N. SPELLER: To illustrate that point I would like to pass around a few plates from one of our tests, to illustrate the effect of air and salt water on iron and steel. They do not need any labels; the uniformity of the steel is quite marked, while the wrought iron is much more pitted.

EDMUND YARDLEY: I would like to ask if these pipes are fit for inside plumbing use? Do they fail at the weld after a little time from corrosion?

F. N. SPELLER: It all depends on what the conditions are in the building. We feel quite confident in saying that the steel of to-day is somewhat better than wrought iron for that purpose. Iron and steel will always corrode. You cannot entirely prevent corrosion by any treatment of the material. In my experience pipe does not corrode at the weld more than at other places.

BENDING BUTT WELDED PIPE.

T. D. LYNCH: How will butt weld bend as compared with lap weld?

F. N. SPELLER: I might answer that question by simply referring to the fact that large quantities of butt weld pipe are used for electric conduits, coils and a number of other uses. If the pipe is placed with the weld on the side there is very little danger of opening the seam in bending. Large manufacturers of electric conduits who use steel butt welded pipe exclusively state that their loss runs about 0.2 per cent. and most of this material is bent cold. They use pipe as small as ⅜ in. bent to a radius of 4 in.

J. L. KLINDWORTH: I would like to ask what is the largest diameter of 40-ft. lengths of pipes that is manufactured to-day.

F. N. SPELLER: Three inches.

RICHARD HIRSCH: Does galvanizing have any effect on the life?

F. N. SPELLER: Yes; galvanizing increases the life very materially. How much I could not say. The environment has everything to do with it.

RICHARD HIRSCH: Is it galvanized on the inside thoroughly?

F. N. SPELLER: The inside is coated with zinc under the same conditions as the outside.

RICHARD HIRSCH: Is it galvanized before it is threaded or after?

F. N. SPELLER: Pipe is galvanized before being threaded in most cases.

EDMUND YARDLEY: Do you consider galvanizing the best protection?

F. N. SPELLER: It is probably the best protection at present.

Marston Hand and Foot Power Machinery.

Interesting information concerning circular saws and band saws is contained in a pamphlet recently issued by J. M. Marston & Co., 226 Ruggles street, Boston, Mass. The hand and foot power circular saw is a powerful machine, owing to its use of a high speed balance wheel. The driving wheel, actuated by the treadle or crank, carries a 20-in. cut gear, which meshes a 2-in. gun metal gear on the saw arbor and a 4¾-in. gear on the lower shaft, upon which is the balance wheel. Consequently the saw has 10 times the speed of the driving shaft and the balance wheel four and one-half times the speed, which provides sufficient momentum and power to carry the saw steadily through the work. Another feature of the saw is an improved iron top. The machine is furnished either with or without an attachment for boring and in two sizes, one with a 40-lb. the other with a 70-lb. balance wheel. The power circular saw bench is furnished with or without boring table. The Marston hand and foot power band saw is a 20-in. machine and is adapted for all kinds of work usually done on a power machine. The power band saw is built in 24-in. size. The pamphlet gives in detail information concerning the various appurtenances of the two types of machines and is profusely illustrated.

The H. D. Evans Steel Company has removed from 65 to 127 Oliver street, Boston, Mass., where larger and more convenient quarters are occupied. This company handles tool steel, and is making a specialty of shearing hot and cold rolled sheets from stock. It has also recently taken the agency for Novo steel and Novo small tools.

The Hudson Bay Country.

A special committee of the Canadian Senate has been appointed to gether information about the country known as Canada's "Hinterland," which may be roughly described as the region north of the latitude of the Saskatchewan water shed. This committee recently held its first meeting and listened to the testimony of A. P. Low, director of the Dominion Geological Survey. Mr. Low's account bore particularly upon Ungava, a district personally explored by him. Ungava borders on Hudson Bay, from whose shore line it extends southward 500 or 600 miles. Mr. Low's report of the climatic conditions was unfavorable, there being eight months of winter and the other four months of comparatively bad weather. He found large areas of iron ore similar to those of the Lake Superior District. He expressed the belief that these ores will prove valuable in the next 25 years, but the application of electrical treatment is desirable. For this purpose the water powers of the district will have great economic value, for they are both numerous and of enormous volume. At Grand Falls, on Hamilton Inlet, there is a water power greater than that of the Niagara cataract, capable of producing millions of horsepower.

The iron ores are a mixture of magnetite and hematite, running as low as 30 per cent. There is no coal in the district, and Mr. Low had found no other minerals in quantities to make this exploitation profitable. In his book, "The Cruise of the Neptune," recently published, Mr. Low, who was the officer in charge of that Government expedition to the Hudson Bay and the Arctic Islands in 1903-1904, has this to say about the best of these ores:

"The richest ores are found in Division III, where extensive beds several feet in thickness are found, containing ore practically free from jasper and ranging in iron values from 30 to 60 per cent. Most of these ores, however, would require separation from the bands and lenses of jasper before becoming sufficiently rich to be economically treated in the furnace. The position of the ores, on the islands separated from the main laid by a sound varying from 1 mile to 4 miles in width, with excellent, almost tideless, harbors, constitutes ideal conditions for shipment. The mining of the ores would also be easy and cheap, if advantage were taken of the great water power of the Nariapoka River, which falls 160 feet into the sea within a few miles of the ore deposits, and from which electrical power might be generated easily and cheaply. Owing to the distance of these ores from the nearest furnaces, and the want of experience in the navigation of Hudson Strait, the shipment of them is at present out of the question. No coal is found in the Hudson Bay region, so that economical smelting near the mines cannot be attempted until electrical smelting becomes practicable, some time in the future. In all the fields where extensive areas of iron bearing rocks occur in the Lake Superior region the search by drilling has disclosed large deposits of concentrated ore, and there is little doubt that such a search in the Hudson Bay region would lead to similar discoveries, as the manner in which the ores occur is favorable for such concentrations."

In his presidential address before the Royal Scottish Society of Arts Prof. T. Hudson Beare surveyed recent developments in iron and steel manufacture. Referring to concentrating and briquetting he cited a new installation at Heerång, Sweden. At this spot ore of a very pure quality is obtained from the mines. It is conveyed first to a crushing plant, where it is reduced to 0.02 in. size. It then goes to the magnetic separators, and the concentrates produced usually contain about 65 per cent. metallic iron; then to the briquette house, where, under a drop press, briquettes 6 in. by 6 in. by 3 in. are made, which are taken to gas fired furnaces. Subjected to a heat of about 300 degrees C., they become firm and hard, any sulphur being eliminated at this stage. The blast furnaces are fired with charcoal of Baltic timber. Waste gas from the furnaces fires the briquette drying furnaces, and also drives gas engines for blowing, electric lighting, &c.

Foundation Problems in New York City.

How the Collapse of Neighboring Buildings Is Prevented and Caissons Are Sunk to Bedrock, Using the Moran Air Lock.

BY C. M. RIPLEY.

The great increase in the number of very tall buildings erected in the downtown section of New York City during the past few years has been made in the face of

Fig. 1.—The Trust Company of America Building.

grave and increasing engineering difficulties. A study of the laying of the foundations for the Trust Company of America Building, Fig. 1, now nearing completion in the financial section of Wall Street, will bring out forcibly what these problems are and how the talent of engineering contractors has been developed. Less than a dozen years ago the conditions set forth in the following would have been considered insurmountable obstacles, making impossible the construction of a 25-story building on this site.

As shown in the plan, Fig. 2, this building is situated between the present United States Trust Company and the Mills buildings. Owing to the high cost of land it was necessary to use every bit of available space, with the result that the foundations of the new building prac-

tically "rub elbows" on either side with those of the old.

It is not generally understood that toward the southern end of Manhattan Island the bed rock slopes downward, so that at Wall Street it is 80 ft, below the curb and at the Battery between 90 and 100 ft. below. Rock appears at sea level at about Fourteenth street, and continues to rise from that point northward, so that for buildings in upper Manhattan it is often necessary to blast away quite a hill before the site is even down to street level. It is due to this characteristic of New York's geological formation, that the excavation for the great Pennsylvania Railroad Depot so much resembles a quarry. In these cases the foundations are supplied by nature.

In striking contrast to such simple foundation problems is the case under consideration: Foundations to be laid to bed rock, through about 80 ft. of quicksand and water bearing strata, which is already heavily loaded by adjoining 10-story buildings. In digging, water and soft mud is encountered but a few feet below the street level and were this soft muck pumped out or removed by any of the old-time methods, more of this fluid material would enter the excavation from either side and the adjoining structures would settle and later collapse. The Foundation Company, 35 Nassau street, New York city, to which was intrusted both the planning and doing of this work, solved these problems by employing the pneumatic caisson process, in conjunction with the Moran air lock, an invention of the company's vice-president, Daniel E. Moran.

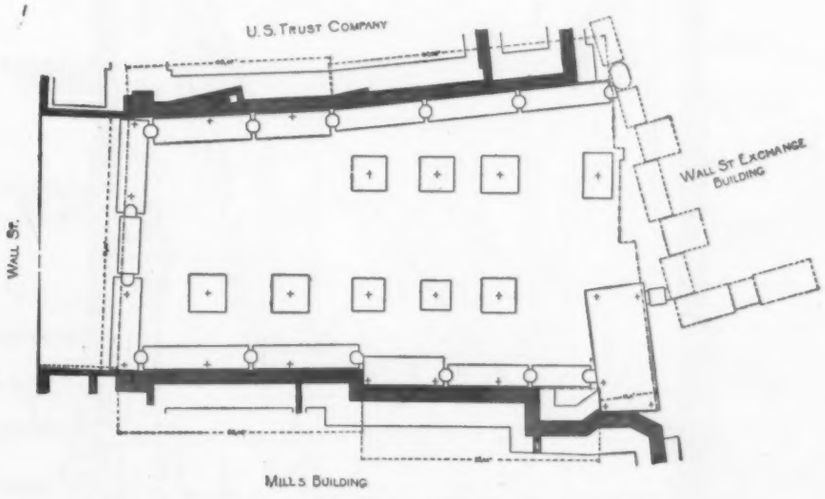


Fig. 2.--Plan of the Trust Company of America Building.

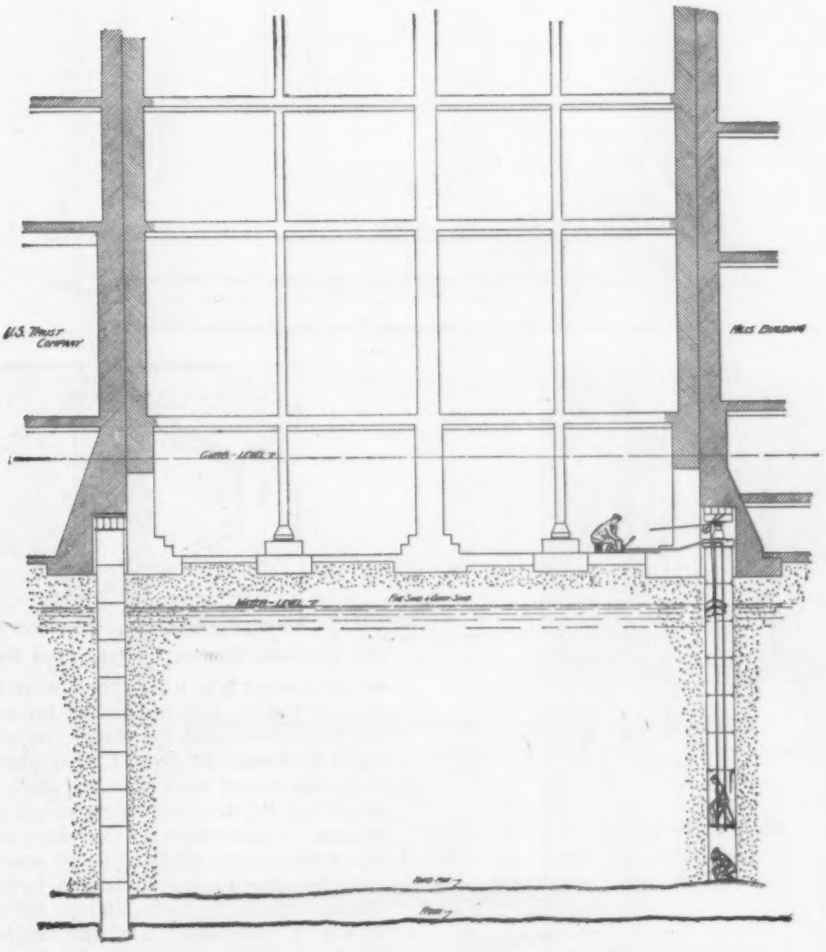


Fig. 3.—The First Stage in the Foundation Work.—Underpinning the Adjoining Buildings.

The principle of the air lock was used for the underpinning of the adjoining buildings, as well as for the main part of the work. Fig. 3 shows how work was begun, even while the old building was being wrecked. Niches about 5 ft. above the cellar floor and 5 ft. wide were cut in the walls of the adjoining buildings with Box electric and Ingersoll-Sargent steam drills at intervals of about every 6 to 9 ft. These were carried downward, through the old foundation, and through the sand under the foundation until the water line was reached. Then one 6-ft. length of riveted steel pipe, 36 in. in diameter, was jacked down into the sand, thereby using the weight of the building in constructing the new underpinning. A downward opening door was installed at the top of this length, a second length was bolted to the first, and then the second downward opening door was installed, completing the miniature air lock. As indicated in Fig. 3, compressed air was supplied to the bottom chamber, and the work pushed lower and lower through quicksand or hard pan, as successive lengths of pipe were bolted to the top and material excavated. When rock was reached the entire cylinder was filled with concrete, the steel pipe remained, and when the steel beams were placed, as shown in the left side of Fig. 3, the underpinning at that point was completed. Twelve of these concrete cylinders support the wall of the Mills Building and 11 that of the United States Trust Company Building, as shown by the circles in the shaded portion of Fig. 2.

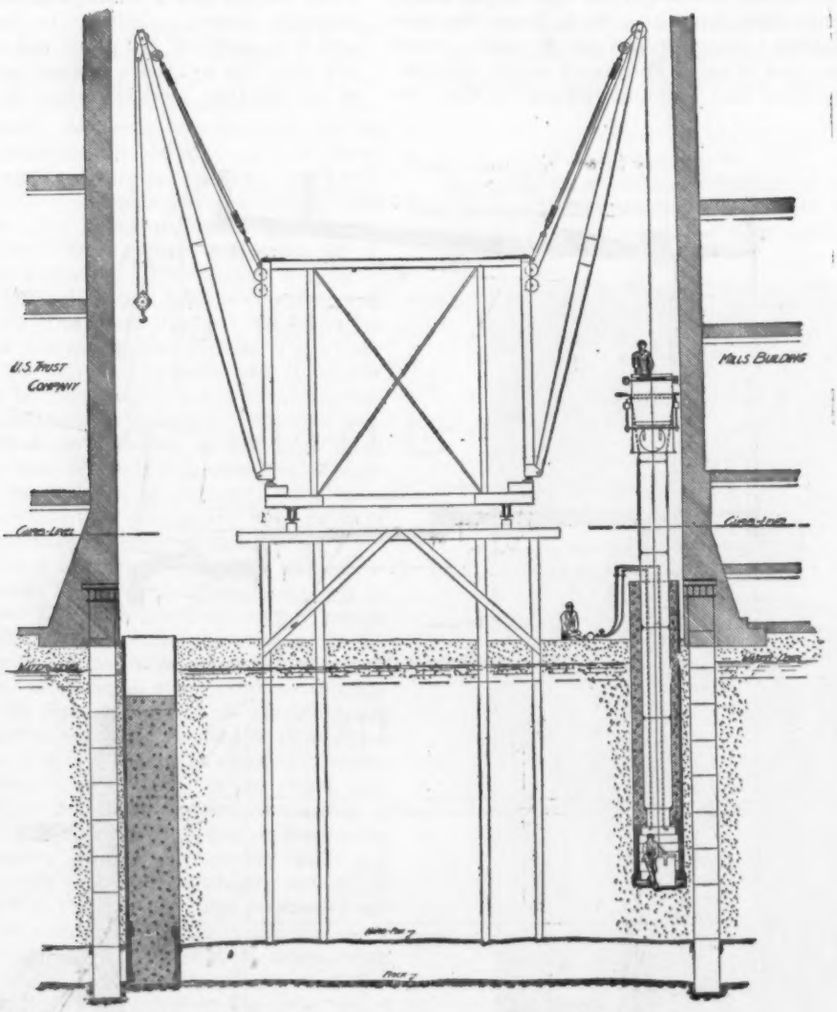


Fig. 4.—The Second Stage.—Sinking the Concrete Piers.

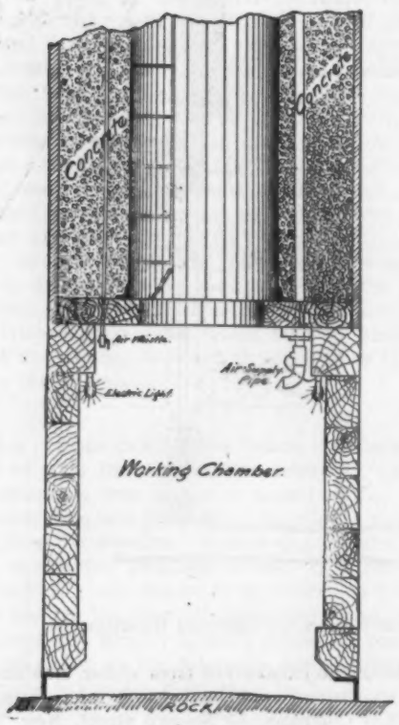


Fig. 5.—Section of a Caisson.

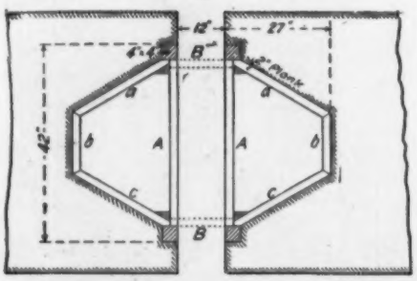


Fig. 6.—Detail Showing How the Piers Were Locked Together.

Twenty-seven concrete piers constitute the foundation work proper under the Trust Company of America Building, these being shown by the square and rectangular spaces in Fig. 2. The remarkable speed with which these piers were sunk to bed rock was possible mainly because the Moran air lock allows the material excavated in the caisson to be hoisted to the open air in one continuous haul, being handled but once in transferring from the bottom caisson up to the dumping place (generally a truck). In Fig. 4 is shown a four-boom traveler derrick equipped with four double-drum Lidgerwood hoisting engines, which effectively covered the entire area, and served to place the caissons, one of which weighed 20 tons and was 14 x 31 x 8 ft. high, at their

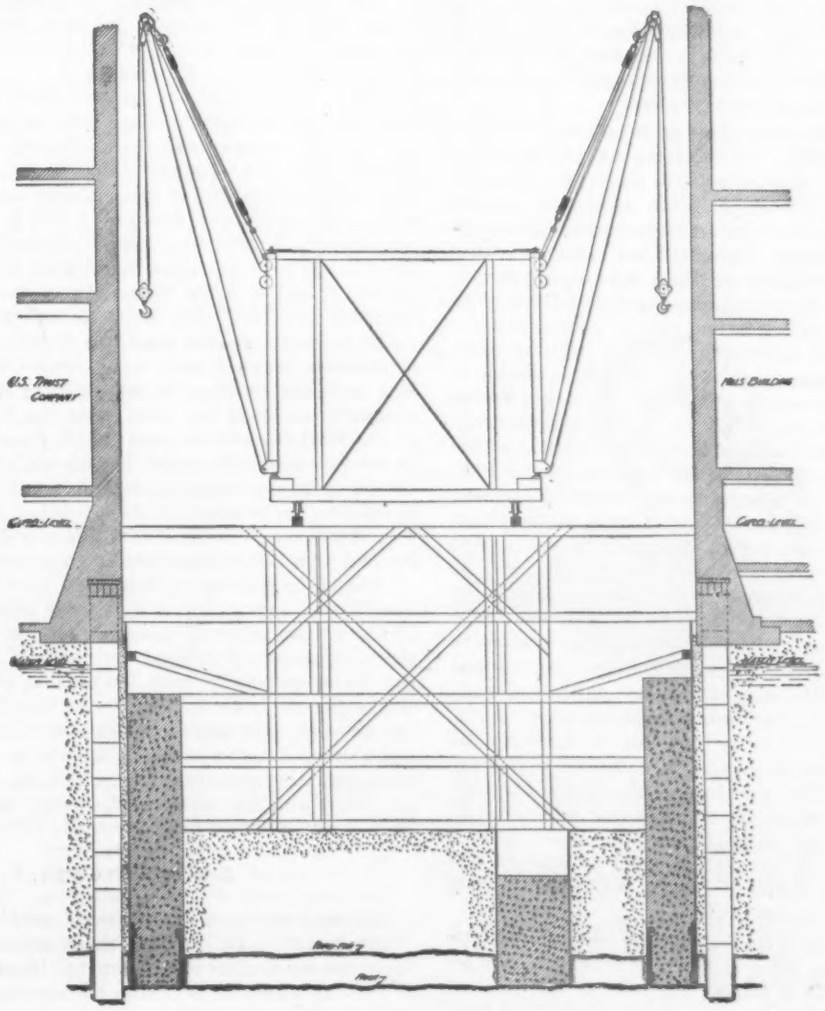


Fig. 7.—Third Stage.—Digging the Cellar.

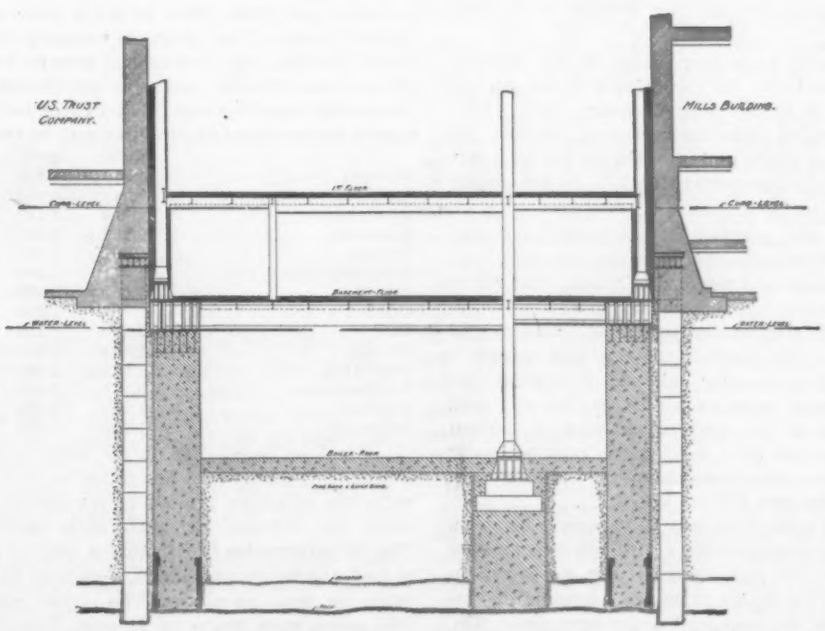


Fig. 8.—The Substructure Completed.

proper location, and also hoisted men and material in and out of the 27 working chambers. A typical caisson or working chamber is shown in Fig. 5.

Fig. 4 also shows the Moran air lock in place near the top of the picture. The man stooping down on the ground is the gauge tender who keeps the pressure steady for the convenience of the men in the working chamber, and the man at the air lock communicates signals between the excavators and the engineers.

The sinking of the piers through the soft soil to bedrock without weakening the adjoining foundation is interesting. After the wooden caisson proper had been located accurately the workmen with picks and shovels excavated inside the open topped frame, which gradually sank of its own weight. After it had sunk to water level, which was but 4 to 5 ft. below the street, preparations were made to apply compressed air, as follows: The open top of the caisson was temporarily roofed and the first 10-ft. section of the steel collapsible working shaft was joined to the upper part of the caisson, as shown in Fig. 5. Section after section was added and then a Moran air lock, as shown in Fig. 4. Then a section of temporary wooden cofferdam was built and fitted to the outside of the caisson, so as to extend its sides upward several feet. This was to act as a false work for retaining the successive thin layers of concrete which were dumped into the annular space inside the cofferdam, on the roof of the caisson and surrounding the working shaft, as will be noticed at the right side in Fig. 4. After the first 10 ft. of concrete had been laid and hardened a second cofferdam was fitted in a higher position and the concreting continued, the first cofferdam being later removed and used as the third. One gang of men and one mixer could move from cofferdam to cofferdam, applying about a 2-ft. layer in each, so that by the time they returned to the first one it was hardened enough to receive its next layer without distorting the sheeting. So nearly the full hight and full weight of the finished pier was used to force the caisson down to its final resting place on bedrock, as rapidly as the excavating could be done by the men inside. Alpha Portland cement was used on this work in a 1 to 2½ to 5 mixture.

Referring again to Fig. 5 it will be noticed that the bottom of the caisson sides is sharp, this being known as the cutter edge, since it follows the level of the excavation, due to the weight above it. Special 2-ton cast iron weights were kept on hand to be piled on top of the concrete pier to help sink it, if the "skin friction" on the sides became too great for the pier to sink of its own weight.

During this process three 8-hr. shifts of the laborers were digging out material in the caisson under an air pressure of from 18 to 24 lb. per square inch. This material was shoveled into buckets and hoisted up through the working shaft and the Moran air lock out to the open air, all in one continuous lift, as previously explained.

When the rock was reached it was leveled off, and still working under compressed air, the concrete was lowered into the caisson and rammed in place. The entire caisson was filled to the top, the temporary roof removed, and as the men retreated up the tube they unbolted and removed a section of the collapsible tubing and hoisted it up for use in sinking another caisson. Gradually the entire space previously used as a passage for men and material in and out of the working chamber or caisson was filled with concrete, thus making the pier one solid monolith of concrete from bedrock to the column base. This is shown on the left side of Fig. 4.

These piers were sunk with only 12-in. spaces between, and the chain of piers around the entire site is connected by bonding between the ends of each pier, as shown in Fig. 2. This keeps the water from the surrounding soil from entering either the basement or subbasement. The method was as follows:

Fig. 6 shows the end faces of two adjecent piers. The semioctagonal groove shown in the faces was formed at the time the cofferdam was put around the top of the caisson. The wooden false work served as a "core," displacing the concrete from its top to its bottom from each end face of each pier. As soon as two adjacent caissons were ready to be bonded the space A B A B was excavated. At the same time the laborers would tear off the boards A and A, saw them into the shorter lengths B and B and nail them in position, as shown by the dotted lines. The space between the piers thus had become octagonal in shape and was carried down the few feet to the water level. The planks *a b c a b c* were removed. A 4-ft. length of steel cylinder 30 in. in diameter was placed in the opening and the space between it and the surrounding concrete and boards, B and B, was filled in with concrete and made airtight. An air lock was bolted to the top of this cylinder and the workmen excavated the material between A and B, tearing out all the lumber as they went down and hoisting all the material to the surface, except that needed for continuing the boards B and B down to the top of the caisson. This octagonal well was then filled to the top with concrete under pressure and the bond was complete. When these connections between piers were completed on the north, east and west borders of the building site it was only necessary to make the bond with the foundation piers of the Wall Street Exchange Building on the south (put in by the same contractor to bedrock) to fully inclose the lot and prevent future flooding of the cellars, which reach to a depth of nearly 140 ft. below the water level. It will be seen from Fig. 2 that this was done without the expense of sinking a separate line of caisson on that side.

Another advantage in this solid wall type of bonded foundation construction is that those piers in the center of the lot can generally be sunk without the expense of the compressed air method, for there is little danger of any water seeping in from the outside, and therefore of weakening the other buildings. At this stage the cellars can be safely dug, during which work the shoring of the neighboring building walls is shown in Fig. 7. Fig. 8 illustrates the appearance when all the substructure is completed and the cellar made ready for installing engines and boilers.

College Growth.

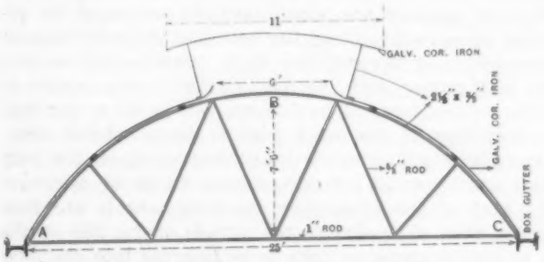
In commenting upon the recent rapid growth of the larger American universities, the statement is made that while the population of the country increased from 1895 to 1905 by about 22 per cent., the growth of these institutions of higher learning was at above three times this rate, or 69 per cent. This ever widening appreciation of the great institutions to which the nation already owes so much, and from which so much more will come in the future, is one of the most encouraging of the many features attending the phenomenal growth which the United States has recently made in population, wealth, commerce and manufactures. The figures for 14 of the better known among these universities may be thus summarized:

	1895.	1905.	Gain.	Per cent.
Harvard	3,550	4,559	1,009	28.4
Columbia	1,942	4,056	2,114	109.0
Michigan	2,818	3,742	924	32.8
Minnesota	2,233	3,633	1,400	62.6
Illinois	607	3,391	2,784	459.0
Wisconsin	1,671	3,390	1,719	102.8
Cornell	1,689	3,330	1,641	97.2
California	1,787	3,200	1,413	79.0
Yale	2,350	3,124	774	32.9
Chicago	1,524	2,901	1,377	90.3
New York	975	2,882	1,907	195.5
Northwestern	2,413	2,481	68	2.8
Stanford	1,100	1,552	452	41.1
Princeton	1,109	1,384	275	24.8

It will be noted that on the above list there is but a single institution which has failed to more than keep pace with the country's growth in population, while in some cases the increase has been little short of marvelous. The 14 universities had in 1895 a total of 25,768 students. in 1905 the figure was 43,625, a gain in 10 years of 17,857, or 69 per cent., as above. The largest relative and absolute gains were made by Illinois, New York, Columbia, Wisconsin and Cornell, which had in 1895 6884 students and in 1905 17,049, a gain of 10,165, or 148 per cent. The increase during the past two years has been no less remarkable, but the best feature, and one which does not appear upon the face of the figures, is that efficiency has made equal progress.

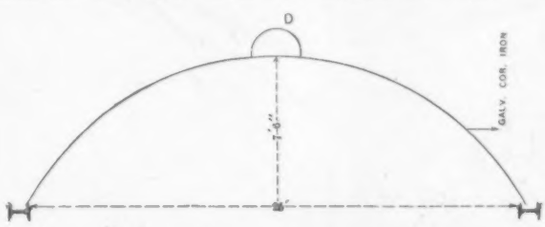
An Australian Type of Roof.

A form of roof that would be very unusual for this country is shown in the accompanying illustrations. It is used on a building of a kind that according to accepted American practice would have a saw-tooth roof, but in Australia, where it was built, it was desired to



Cross Section of Roof Over Foundry.

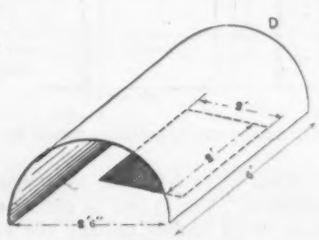
use a roof that would require little wood on account of the high cost of timber there. The roof is a galvanized iron one, as indicated, and covers the Wakefield street works of A. Simpson & Son, Adelaide, South Australia, fireproof safe and bedstead makers, iron founders, galvanizers, japanners, coppersmiths, tinners and nickel platers. These works cover a considerable area with a structure one story high, but divided into bays each



Cross Section of General Form of Roof.

covered with the curved roof indicated in the engravings, there being all told some 13 bays side by side. Incidentally the form of roof is advantageous from the fact that the acid and smoke laden atmosphere of foundry and galvanizing departments would have a more or less detrimental influence on wood.

One of the sketches shows a cross section of the roof used over the foundry and the galvanizing departments. The trusses, made up of round and flat iron (probably



Ventilating Cap in Roof.

used because these could be had cheaper than structural shapes) are spaced 10 ft. apart on centers. They are tied together with ½ x 2 in. bar iron purlins, to which the corrugated iron is bolted with a hook form of bolt. A built-up box gutter runs along each side of the bow roof, this having the general for mof an I-beam, but being made of 3-16-in. girder plates and having a galvanized iron lining. The monitor at the top of the roof provides for ventilation.

The roofs over other parts of the works have no truss work, but at intervals of about 20 ft. 3 x 9 in. tie beams are required to give the roof stability. A hole is cut from the center of the roof every 10 ft. at D, 2 x 2 ft. in size, for ventilation purposes. This is covered as shown in the detailed sketch. At suitable intervals skylights are inserted, roughly half way down the curve of the roof. The span of the roof, its rise and other dimensions, are given in the illustrations.

The U. S. Light Portable Electric Drill.

A first consideration in the construction of portable electrical tools of every description is to reduce the weight as much as possible. At the same time care must be taken to make the power of the tool accord with its intended capacity; that is, the tool must not be overrated. Probably the lightest portable electric tool ever made is the 3-16-in. drill, weighing only 6 lb., shown in the accompanying engraving, and manufactured by the United States Electrical Tool Company, Cincinnati, Ohio. This tool is capable of drilling holes up to 3-16 in. in diameter in wood, iron or steel, and is of ¼-hp. capacity. It is about 8 in. long over all and 4 in. in diameter. This tool is specially designed for trunk and furniture manufacturers and also for light work in any machine shop, such as drilling oil holes or holes for screws in name plates. It is manufactured in two types, A-110 and

A Light Portable Drill Made by the United States Electrical Tool Company, Cincinnati, Ohio.

A-220, for 110 and 220 volts, respectively. Extra handles of various kinds are supplied where necessary, making it suitable for many different operations.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Wednesday evening, February 6. Vice-President Alexander E. Outerbridge, Jr., of William Sellers & Co., Inc., occupied the chair. The general committee for the entertainment of the American Foundrymen's Association at the May convention in this city made a provisional report to enable the secretary of that association to make his announcement regarding the convention, and which was fully covered in *The Iron Age* of January 31.

The association, by motion, extended its hearty co-operation to the New England Foundrymen's Association in its protest to the Interstate Commerce Commission against the 25 cent advance by the railroads in freight rates on pig iron from Southern furnaces, and will act in conjunction with that association in the matter.

Owing to the enforced absence of W. A. Pollock-Davis, who was to have read a paper on "The Introduction of Nickel and Molybdenum Alloy in Foundry Practice," no formal subject was before the association for discussion. Mr. Outerbridge entertained those present with a brief recital of his early experiments with use of ferromanganese in the ladle in car wheel practice, particularly as to its effects in the production of the desired depth of chill.

The production of iron ore by the Cornwall mines in the Lebanon Valley, Pennsylvania, in 1906, was 763,788 tons, making the total since these mines were opened in 1740, 19,662,692 tons. Of the leading Lake Superior mines, the Norris groud had produced 13,639,279 tons, the Chapin 13,404,416 tons, and the Lake Superior on the Marquette range, 13,040,436 tons to the end of 1905. The first two probably passed the 14,000,000 mark, with their 1906 production added. On the Mesaba range the Fayal had 12,934,190 tons to its credit at the close of 1906, and the Mountain Iron, 14,808,654 tons.

Two Novel Heating Furnaces.

Interesting because of their mechanism are two heating furnaces used by the International Harvester Company, Chicago, in several of its plants for tempering small duplicate parts in large quantities. One of these, illustrated by the sectional elevation, Fig. 1, is an automatic or continuous heating furnace, for heating articles rapidly and uniformly, invented by J. H. Haskins, for many years in charge of the manufacturing department of the McCormick Company. The other, shown in Fig. 2, is a section tempering furnace, having an automatic feeding device, which was invented by G. W. Packer, connected with the Deering branch of the International Harvester Company.

The Haskins furnace includes mechanism for conveying small parts to and through the furnace, and delivering them into cooling tanks at the end, and is provided with fuel and heating chambers especially adapted to uniformly and economically supply heat during the transit of the material. In the form illustrated the furnace is especially intended for heating the cutting edges of cutter bar sections and tempering them. The furnace is of approximately cubical form, inclosed on the sides and open on the bottom to admit the revolving tong wheel, and is mounted on legs or supports, so that a tray of cooling medium may be placed beneath it. Fuel chambers are mounted upon brackets at the opposite ends of the furnace and are connected with flues which open into the upper part of the furnace. The axes of these flues are slightly offset, so that a whirling motion is imparted to the burning gas in the heating compartment, thereby more effectually diffusing the heat throughout this chamber. As ordinarily arranged a single furnace is provided with four tong wheels, these being mounted on a single ball bearing shaft, which extends beneath the furnace. At one end the shaft is revolved by a ratchet wheel, having one tooth for each tong. A rocker arm carrying a pawl engaging the ratchet wheel is oscillated by a crank on an auxiliary shaft, which also provides the feeding movement.

In front of the furnace, or at the right, as seen in Fig. 1, is a table on which are four chutes, one directly in line with each of the tong wheels. These hold columns of the cutter bar sections in position for feeding into the grasp of the tongs. An aperture at the bottom of the chute on the side toward the furnace is just the proper width and thickness to pass a section. A horizontal pusher in line with the lowermost section projects it into the opening between the jaws of the pair of tongs at that moment opposite the aperture, and the operation is repeated as each new pair of tongs comes into that position. The four pushers are simultaneously advanced or retracted by a reciprocating bar operated by eccentrics, at opposite ends of the auxiliary shaft. Safety clutches connect each pusher with the bar, so that if any pusher is accidentally obstructed no damage will be done, nor will the operation of the other pushers be interfered with. The crank which actuates the ratchet wheel on the tong wheel shaft has its effective stroke timed to alternate with that of the eccentrics; the tong wheels are first rotated, then while the rocker arm is on its idle stroke the eccentrics cause sections to be inserted into the tong jaws, and similarly the eccentrics are on their idle stroke while the ratchet wheel is being advanced one notch.

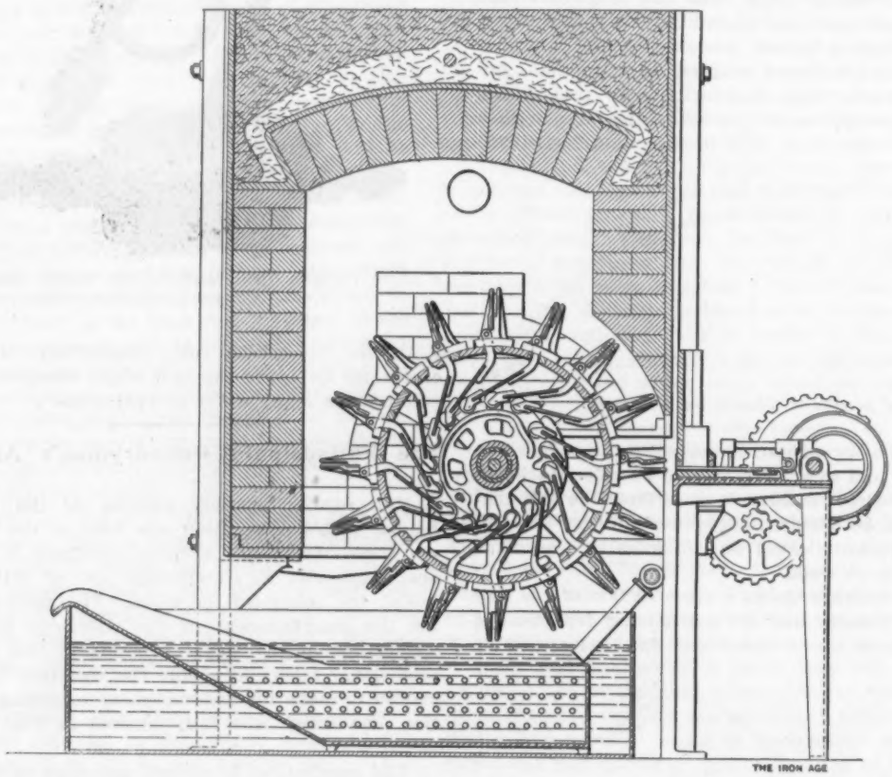


Fig. 1.—The Haskins Heating Furnace Used by the International Harvester Company for Tempering Small Sections.

The construction of each of the tong wheels is clear from the illustration. The wheel is composed of a rim made in sections, with spokes uniting the sections to a hub secured to the shaft. To these rim sections are secured the stationary jaws of the tongs. The movable jaws are pivoted to the stationary jaws and have curved heels provided with yielding levers, the inner ends of which carry rollers resting upon a cam surface. The cam is journaled on the hub of the tong wheel and held against rotation. Its form is such that as each pair of tongs approaches the aperture in the front of the furnace the jaws remain open, and immediately as the wheel starts to move the jaws are closed tightly, gripping the section from this point on while the piece passes through the heating chamber, being finally opened as the tongs issue from the heating chamber, so as to discharge the section to the cooling tank beneath. Thereafter the jaws remain open until they grip a new section. The yielding levers of the movable jaws accommodate varying thicknesses of sections, while insuring a firm grip upon them.

The Packer furnace is also a section tempering furnace, its function being similar to that of the Haskins furnace. Although intended for similar work the furnaces themselves are different, and the feeding mechan-

ism decidedly so. It is particularly the latter that is interesting in both cases. The frame of the machine is supported on legs, and the furnace, rectangular in form, is provided with gas burners along the side. Through the heating chamber the parts to be tempered are passed by a conveying chain, which is carried by wheels at opposite ends of the furnace, and is supported from the frame by brackets. The chain is driven by the carrying wheel at the right, which has sprocket teeth engaging in its links, and the upper side is held taut by providing friction in the left hand chain wheel. The links of the chain are integral with wings of a shape adapted to hold knife sections between the wings of adjacent links while they pass through the furnace, but while the chain is changing direction around the wheels at either end these wings separate, allowing sections to be freely inserted or ejected. As in the other furnace the sections are discharged into a hardening bath at the delivery end of the machine.

The automatic feeding device comprises an inclined chute in which the sections are inserted vertically on edge, a weight which maintains sufficient downward pressure on the section to hold the last one of the series in position for feeding, and a vertically reciprocated pusher for sliding the sections one at a time into the spaces between the wings of the chain links. This pusher is reciprocated by a crank driven through a friction clutch, and can act only when the chain is in the proper position for feeding. The knife section next in order is held ready to feed at the proper moment, by a vertical swinging stop having a lip that engages the lower edge of the section. When the advancing edge of the wing of the link just passed engages a projection on this stop, it swings it out of the way so that the crank actuated pusher is free to eject the section into the open space between the links of the conveyor chain at that time in the proper position. A spring holds the swinging stop normally in position to prevent feeding.

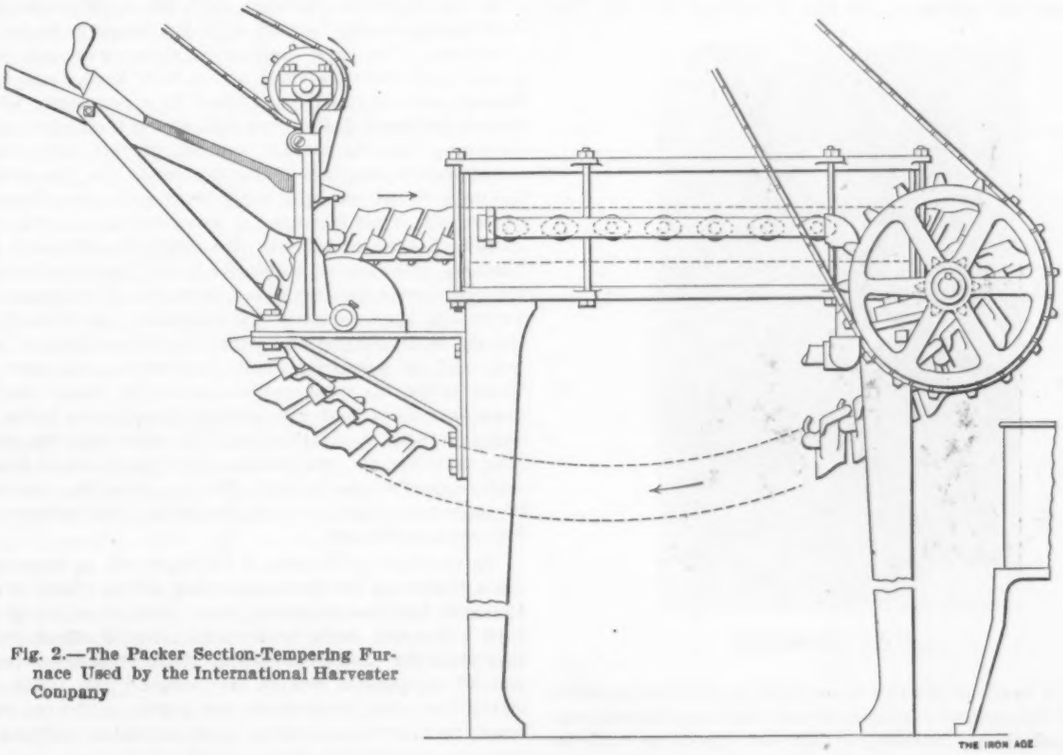


Fig. 2.—The Packer Section-Tempering Furnace Used by the International Harvester Company

Machinery hall, one of the principal Carnegie Technical School structures at Pittsburgh, is expected to be completed this week, and the woman's school will be ready by March 1. At present 1400 students from 190 cities in 26 States are receiving instruction at the Carnegie Technical School, and more than 5000 names are on the waiting list. The capacity will be increased by 600 to 700 each year until 5000 students can be accommodated.

New Canadian Undertakings.

TORONTO, February 9, 1907.—Application has been made by the King Radiator Company, Montreal, for a tract of 3 acres of land and 11 acres of water in Ashbridge's Bay, Toronto, such tract to be used as the site of works for the manufacture of radiators and furnaces. The company would expend $200,000 on buildings.

The Ontario Iron & Steel Company's plant, which has been under construction for some months at Welland, is being built on a larger scale than the company's agreement with the town called for. It will cost $300,000, will employ about 500 men and is expected to be ready for operation by June 1.

Towns in the Niagara District are competing keenly for the works the North American Mining & Refining Company proposes to build in that part of Ontario. Thorold, Niagara Falls, St. Catharines, Port Dalhousie, Merritton and Welland are all negotiating for the new enterprise, which is to work upon ore from the Cobalt mineral field.

Montreal expects to have a new car manufacturing industry added to the two large ones it already has. Men recently connected with the Dominion Car Company are active in the work of organizing the new company, which is to build wood and steel cars.

The Dominion Iron & Steel Company's production for January was as follows: Pig iron, 19,375 gross tons; steel ingots, 20,250 tons; blooms, 18,400 tons; rails, 7600 tons; rods, 7966 tons. The excellent showing of the company's works during a month whose weather is always adverse to operation is quite noteworthy. Some days were so cold that the stokers at the gas producers refused duty and the rail mill's operations were interrupted on account of the lack of steel. It is the intention of the company to ship rails next summer as far west as Port Arthur, and vessels are now being built in England for the carrying of such cargoes. A scheme is being worked upon for the getting of return freight for such vessels, involved in this scheme being a project for the building of an independent grain elevator at Port Arthur.

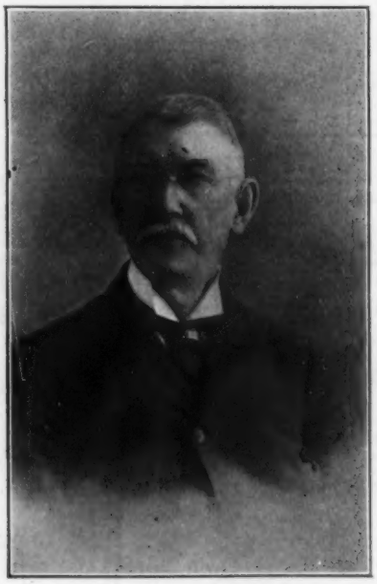
While the Sydney company is planning for more business in the West, the company at Sault Ste. Marie, the Algoma Steel Company, is steadily increasing its output, its production of rails in January amounting to 19,285 gross tons, as compared with a previous high record of 16,800 tons. C. A. C. J.

Henry C. Sergeant.

Henry Clark Sergeant of the Ingersoll-Sergeant Drill Company—now an integral part of the Ingersoll-Rand Company—died at his home, Westfield, N. J., January 30, aged 72 years. He had won a world-wide reputation as a facile, prolific and highly successful inventor, especially in the line of rock drills, air compressors and mining and excavating machinery in general.

Mr. Sergeant was born at Rochester, N. Y., but his earlier years were spent in Ohio. He was of uncurbable activity, both physical and mental, from the beginning. He had only a common school education and was working in the machine shop at a very early age. He quickly began to see the undeveloped possibilities of systematic manufacture by the aid of special machinery. His first practical application of his theories was to the making of the spokes, hubs and felloes of wagon wheels. He designed special machines for this work and at the age of 18 he accepted a contract for manufacturing wheel parts in quantity. In this he was so successful that in two years he was taken into partnership by a firm manufacturing wagon wheels.

The routine of the factory, however, could not hold him, and after severing this first business connection, the



HENRY C. SERGEANT.

next six years of his life were spent in various pursuits, chiefly commercial, in which he met with varying success. He was a ready speaker, though not known as such in later years, and found favor as a lecturer. He had figured for a time also as a champion skater. He still found time and opportunity in the line of invention and the development of labor saving machinery. His first patent, issued when he was 19, was for a boiler feed. Succeeding patents suggest the range of applicability of his inventive faculty. In December, 1858, he patented a steam engine governor. This was in fact a governor for marine engines to prevent their racing to destruction when the wheels were out of water. This was soon after adopted by the United States Government and applied to the warships of the period. He then obtained patents for gas regulators, for steam pumps, four for steam boilers, five for brick machines, a fluting machine, six for water meters, all before he had struck what must now be considered his life work.

Three of the brick machine patents were issued in 1867 when he was a resident of Columbus, Ohio, but soon after that he started a machine shop of his own in New York, building a wide variety of machines and developing many crude ideas into practical working successes. In the early seventies hither came Simon Ingersoll, with the drawings for the first Ingersoll rock drill, a then untried device. The possibilities of and the large future for the rock drill particularly attracted Mr. Sergeant. None can say now how much he contributed to the development and success of the original Ingersoll drill, but at least one patent issued to Ingersoll and Sergeant as joint inventors. The Ingersoll Drill Company was formed and introduced the drill in the rock excavating fields.

Although the drill was at first operated only by steam, its advantages when driven by compressed air and the absolute necessity of using air for mine and tunnel work turned Mr. Sergeant's attention to the improving of the design and details of the air compressor, which the Ingersoll Company began to market in connection with the drills and for other incidental uses which began to develop. As the business grew, the partnership of Sergeant & Cullingworth was formed, with shops at Twenty-second street and Second avenue, New York.

Again turning from the task of manufacturing, Mr. Sergeant's interest was sold to the Ingersoll Drill Company, and he went to Colorado to put into practical operation some of his mining methods. He operated a silver mine for a time. Meanwhile he had developed another complete rock drill with an entirely novel valve motion. Two patents on this drill are dated 1884. He brought his new drill East in 1886 and formed the Sergeant Drill Company, which began building the drill at Bridgeport, Conn. Two years later the new company joined hands with the Ingersoll interests and the Ingersoll-Sergeant Drill Company was formed, with Mr. Sergeant as its first president. The new company's shops were at Ninth avenue and Twenty-seventh street, New York, these shops having been occupied for a short time previously by the firm of Sergeant & Cullingworth, which then went out of existence, Mr. Sergeant's interest in this firm having terminated before he went to Colorado. He remained at the head of the company but a short time, then disposing of the bulk of his interest. A considerable time was then spent in London and Paris. He returned to the rock drill business, this time as a director in the Ingersoll-Sergeant Company, with the purpose of devoting all his time to invention in the interest of the company. He labored constantly in developing and improving the company's products and in spreading their application into new and wider fields, his most notable inventions being the Sergeant auxiliary and arc valves, tappet rock drills, the Sergeant release rotation for rock drills and the piston inlet valve for air compressors, all of which are in general and successful use to-day. He was also the originator of many new ideas in stone channeling, coal undercutting and associated lines.

In the days of Sergeant & Cullingworth, in response to the solicitations of the management of the Third Avenue Elevated Railroad Company, New York, of which he was then a director, for a device which would afford protection from the constant losses accruing from the repeated use of uncancelled tickets, he designed the ticket canceling box now familiar to the public, which so mutilates the ticket as to make it impossible to defraud the company by using it again.

Mr. Sergeant's inventive faculty and his suggestive and stimulating ideas were devoted to the interests of the Ingersoll-Sergeant Company for all the remaining years of his active life, and the business grew and prospered continually. The works at Easton, Pa., were occupied in 1873, the great shops at Phillipsburg being a necessity a decade later, the consolidation of the two foremost but competing companies in their line in the world into the Ingersoll-Rand Company being also a natural sequence. He spent much of his time in Easton until two years ago when failing health compelled him to give up his former activities. After the consolidation of the Ingersoll-Sergeant and Rand companies he still retained his interest, although his health would not permit his active participation.

In his early days Mr. Sergeant was never content to tarry long under fixed conditions or in the same location, and up to 1893 he had made his home in 26 different cities and towns. In that year he located at Westfield, N. J., and at once took a deep interest in the growth of what was then but a small settlement. He was a sufferer from rheumatism in his latter years, but the immediate cause of his death was paralysis. He is survived by three daughters and a son.

As an inventor he had probably no special predilection

in the direction of the devices in which success came to him, his real specialty being merely to accomplish the thing which it thus came in his way to do. His chief characteristic may be said to have been a certain mental alertness, a quickness to see the best way to do a thing, or in ways already devised to see the little thing lacking and to supply it, transforming a device of doubtful value often into a great success. This faculty he applied as he had opportunity to the inventions of his competitors, as he had an undoubted right to do, and as it was to the interest of mankind that he should do, and in which he was as far from being a plagiarist or a mere adapter as if a competitor had never existed. The pronounced and indisputable character of his inventions is attested by the fact that with more than 50 patents to his name so few of them have ever been subjects of litigation.

Joseph Flather.

Joseph Flather, president of Flather & Co., Incorporated, Nashua, N. H., died in that city February 3, as was briefly announced in *The Iron Age* of February 7. Although he had been in failing health for the past three or four years his death was unexpected. The cause was a valvular disease of the heart, aggravated by a slight attack of pneumonia.

Mr. Flather was born in Bradford, England, April 1, 1837, and received his education in the common schools of that city and of Norwich, England, to which place his parents had moved. At the age of 11 years he entered the repair shop of a large mill at Norwich, in which employment he remained for a year, when his family returned to Bradford. Here he was apprenticed to his uncles, William and Henry Hodgson, manufacturers of worsted machinery, and remained with them for about five years. When he was 19, his term of apprenticeship having expired, he took passage with his father on a sailing vessel for Philadelphia, where they landed in September, 1856. They were unsuccessful in finding employment in or around Philadelphia, and made their way to Harpers Ferry, W. Va., where relatives were living. Because of his unusual skill with the file, Joseph Flather secured work filing gun sights at the Government arsenal. Afterward he worked for a while in a railroad repair shop at Zanesville, Ohio, but soon returned to Harpers Ferry.

In 1859 he went to Nashua and entered the employ of Chase & Co., manufacturers of sewing machines. He remained there until the Civil War broke out, when he secured contract work in gun factories in Binghamton and Yonkers, N. Y., Trenton, N. J., and Bridgeport, Conn. While at Bridgeport he worked on the tools first used in the manufacture of the Henry repeating rifle, the first of its kind used by the Union troops.

At the close of the war he moved to Parkersburg, W. Va., with his two brothers, and established a shop for the manufacture and repair of oil well tools, but the venture was a failure, because the proprietors of the oil wells, combining business with pleasure, took their holiday and spent their money in Pittsburgh and other cities instead of patronizing home industries. Consequently Joseph Flather, with his brothers Edward and William J., returned to Nashua, and formed a co-partnership with the late J. K. Priest, who at the time was manufacturing sewing machines, but who later established the American Shearer Company, for the manufacture of clippers of all kinds. The idea of the partners was to manufacture not only sewing machines but lathes, but the lines were so dissimilar that the partnership was soon dissolved and the Flather brothers took over the lathe department.

It was at this time that the firm of Flather & Co. came into existence, Joseph and William J. being the active men in the business and Edward a silent partner. Times were very dull and business scarce, and success hung in the balance for many years. After several changes in location the firm built a wooden shop on the site of the present buildings. In 1876 the building was destroyed by fire, the loss being total excepting for $2000 or $3000 insurance. With this money the shop was rebuilt on the same location, but of brick, the wisdom of this being shown in the fact that the building is still a section of the present works. In 1876 the firm exhibited its lathes at the Centennial Exhibition at Philadelphia, and it was here that the brothers secured their first foreign business, their lathes having attracted the attention of manufacturers from Eskultuna, Sweden, and Frankfort, Germany. This small beginning paved the way to what has grown to be a large and profitable foreign trade, extending farther and farther until it now includes every country where machine tools are used.

During all the panic years up to 1879 Flather & Co. had great difficulty in making both ends meet, and only succeeded by the utmost economy and perseverance and the willingness to accept any kind of business, including job work, special machinery and even two-wheeled velocipedes, forerunners of the safety bicycle. After these years affairs took on a brighter look and early in the '80's the firm was on a sound basis and began to enlarge. With continued prosperity other additions were built until the present works were obtained, beyond which point Joseph Flather had no ambition to go, although several times business conditions would have justified further increase. In 1885 Mr. Flather invented the patent feed,

JOSEPH FLATHER.

so-called, which was the first successful effort in placing the rod and screw on the front of the lathe so that either could be driven by both belt and gears. His inventions included other improvements of importance. The partnership existing between the brothers expiring in 1901, W. J. Flather withdrew from the business and a company was incorporated under the title of Flather & Co., Incorporated, with Joseph Flather as president and treasurer, which offices he held at the time of his death. He was also treasurer of the Flather Foundry Company.

Joseph Flather's reputation as a builder of machine tools was international. A fixed rule of his business was to manufacture an honest machine. His maxim might have been that the way to succeed and to maintain success is to keep absolute faith with the customer.

It was a striking commentary upon his personality that in the initial period of the existence of the National Machine Tool Builders' Association, in 1901-2, before competitors brought together for the first time from various parts of the country had come to understand one another, when the striking of a false note might have meant disruption, he was chosen to head the new organization as its president. His relations with the members of his family went further than affection and pride, for he made them his confidants. He leaves a widow, five daughters and two sons. One son, Herbert L. Flather, is superintendent of the works of Flather & Co., Incorporated, and the other, F. A. Flather, is treasurer of the Boott Mills, Lowell, Mass.

The Pittsburgh Water-Softening Apparatus.

The purification of water for boiler purposes by previous chemical treatment in precipitating or water softening plants has been practiced in this country only about 10 years. During this time several hundred plants have been installed for various purposes, covering practically every character of water that is met with. These plants as built by different manufacturers have differed in the details of construction, in the application of the water to the machine and the reagent solutions to the water, but all may be divided into two general classes: The intermittent and the continuous or automatic types.

The intermittent type of softening plant was the first to become generally used, and the pioneer manufacturers built practically nothing else, using wooden tanks and in many cases wooden filters. Of this type there are by far the larger number in use. The simple construction and operation of the intermittent apparatus apparently appeals to the majority of purchasers and users, in spite of the fact that it occupies considerably more space, is very hard to adapt to many conditions for economical operation, and is of a character that must in time develop a considerable repair account.

Fig. 1.—A Pittsburgh Intermittent Water-Softening Plant Installed for the Buffalo Union Furnace Company, Buffalo, N. Y.

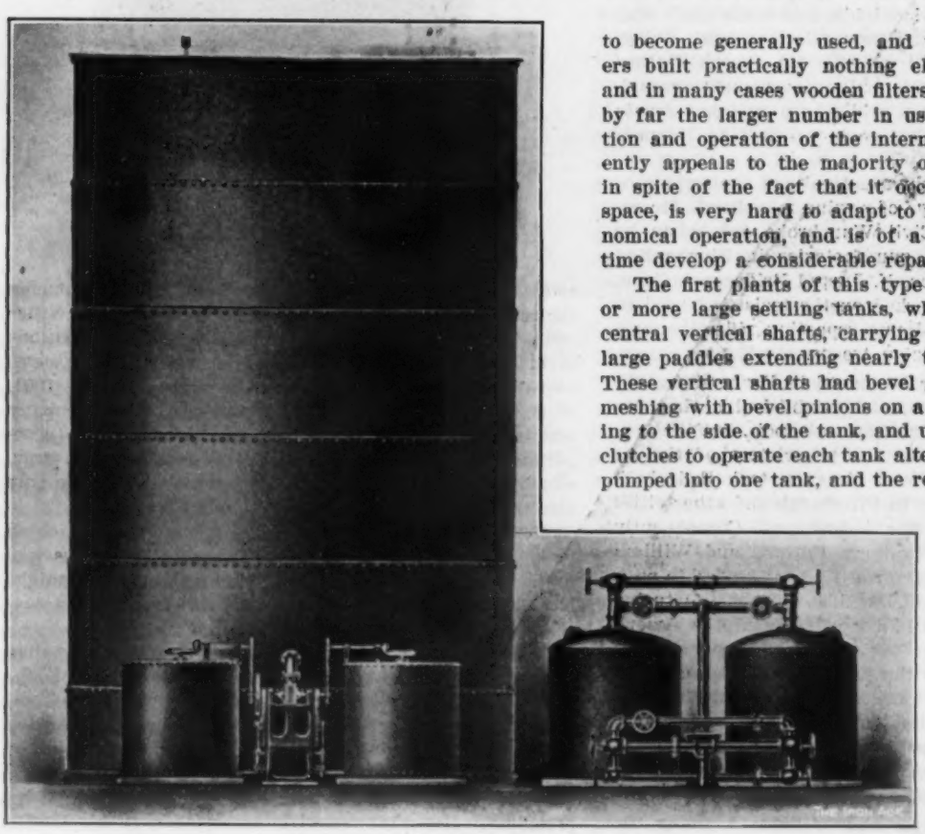


Fig. 2.—A Continuous or Automatic Softening Plant Built by the Pittsburgh Filter Mfg. Company.

The first plants of this type installed comprised two or more large settling tanks, which were equipped with central vertical shafts, carrying at their lower ends two large paddles extending nearly to the sides of the tank. These vertical shafts had bevel gears at the upper ends, meshing with bevel pinions on a horizontal shaft extending to the side of the tank, and usually arranged through clutches to operate each tank alternately. The water was pumped into one tank, and the reagent solution for treating it, mixed up in a small tank located on a platform between the two settling tanks, was then allowed to flow into it. This being completed the paddles were started to mechanically mix the solutions. Where lime and soda are used two separate operations are necessary to mix each with the water. The water after being agitated was carried through a floating outlet pipe to a gravity filter placed somewhere beneath the tanks.

This filter resembled the usual gravity filter, except that the filtering material used was somewhat coarser

than is used for water carrying suspended clay matters such as found in river waters generally. From the filter the water was ordinarily allowed to flow into a receiving tank, from which it was distributed by pumps. In a plant of this type, when open heaters are used for heating the boiler feed water, it becomes necessary either to pump the water from the receiving basin into the heater and then repump it from the heater to the boilers, or to raise the whole plant upon a tower high enough for the water to flow by gravity into the heater from the filters. A plant arranged in this manner requires an engine or motor to revolve the agitating devices, and the belts, gears, &c., call for attention as they wear and need readjusting. Where tanks are elevated a very slight settlement to one side or the other (a matter almost impossible to avoid) throws all the shafting out of alignment. In some cases even the filling and emptying of the tanks will change the alignment of the shafting sufficiently to cause continual trouble. It is also necessary to hoist the chemicals to a platform at the top of the tanks and where they are exposed to the weather a house must be built to protect the operator and prevent the materials from being blown about and staining the sides of the tanks and structures.

More recently constructed plants of this type do not require the operator going to the top of the tanks. Each tank is covered with a conical top, and the operating is done entirely from the ground, the agitating being done by compressed air, which obviates the use of a steam engine or motor, and shafting, gearing and belting. The solutions are mixed in a small tank on the ground and pumped into the larger tank above. The range of action of the operator and his labor are thus reduced to a minimum, and the economical operation of the plant thereby increased. Fig. 1 is a general view of a plant recently installed at the Buffalo Union Furnace Company, Buffalo, N. Y., by the Pittsburgh Filter Mfg. Company. It may be noted here that the treating tanks are elevated a considerable distance from the ground. This is to provide for the flow of water to the open heaters by gravity, so that only one pumping is necessary. Plants similar to this have recently been installed for the American Steel & Wire Company, at Cleveland, and the Shenango Iron & Steel Company, at Wheatland, Pa., by the Pittsburgh Filter Company.

The largest single intermittent softening plant in the world was installed by the same company for the Tennessee Coal, Iron & Railroad Company, Ensley, Ala., several years ago, and has a capacity for supplying 35,000 hp. of boilers. The entire construction is steel. Each of the treating tanks holds about 175,000 gal. of water and is elevated on columns of sufficient hight to allow the flow by gravity to the filters. From the filters the water flows to a clear water basin, where the pumps take it for distribution.

Fig. 2 illustrates a continuous or automatic softening plant of recent development. This type of plant, as heretofore constructed, has had practically all of its operating parts placed on top of the machine, necessitating the hoisting of the chemicals with which to treat the water to a storehouse on top of the machine, the building of an operating room from 25 to 50 ft. above the ground, with ladders or iron stairways for men to climb up and down in the operation of the plant. This arrangement at such times as the chemicals are hoisted requires the services of two or three men and at other periods one man continually, who could be employed a greater portion of the time at other work, if his time was not taken in climbing up and down the steps.

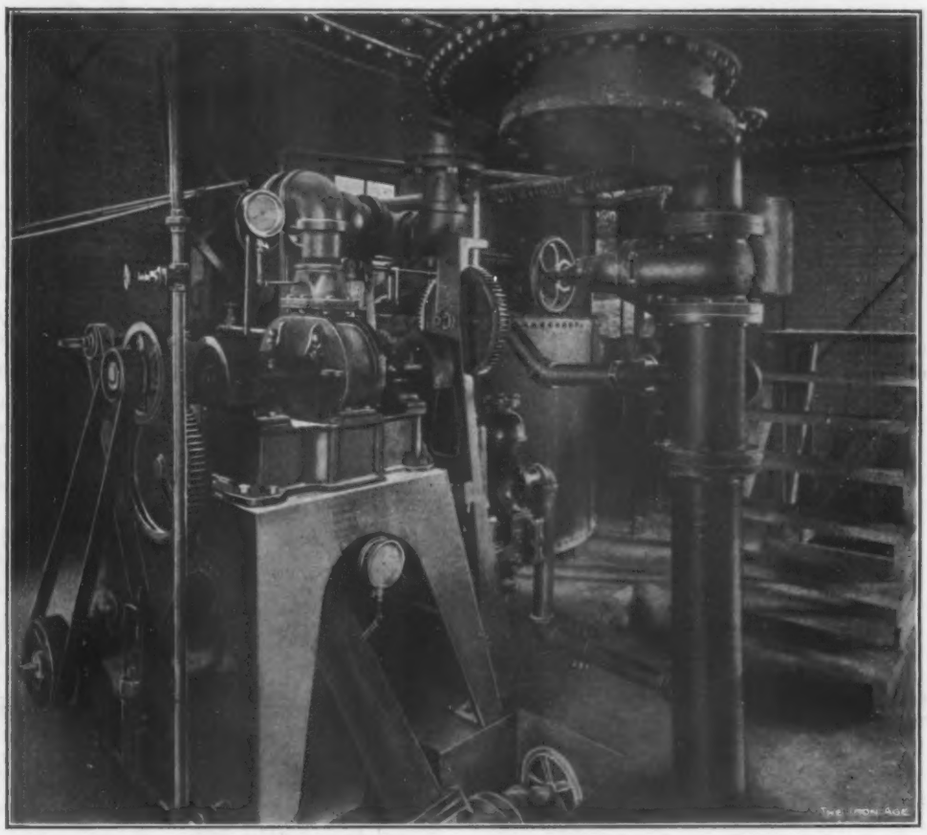


Fig. 3.—The Operating Apparatus for a Continuous Plant, Including the Proportional Water Motor for Introducing the Required Amount of Softening Reagent.

The plant here illustrated, it will be noted, has all the operating parts upon the ground floor. The solutions are mixed in tanks below the machine and pumped into the machine by the raw water operating a motor as it passes to the machine to be treated. The arrangement for the control of the solution is positive, and after the quantity of solution is determined and the pumps regulated for supplying it the machine works automatically, maintaining the proper proportionate mixtures during the period of operation, whether it be operating at partial capacity or full capacity. Fig. 3 gives a detail of the mechanism operating one of these plants.

It will be seen that in both types of plants here illustrated the amount of attention required from the operator is small, while the mechanical arrangement has

been carefully worked out to secure the greatest possible simplicity without sacrificing accuracy in treatment and operation. These designs have been developed after many years' experience in the construction of softening plants.

It has been demonstrated that there are many waters being used in boilers in which the economy of labor and fuel alone has paid the cost of the installation of a water softening plant in one year's time. There are comparatively few waters that are used in boilers west of the New England States that it would not be profitable to soften. Perhaps no accessory to a boiler plant will give greater returns for the money invested. The economies which it produces are in practically every item of power production. A pure water for boilers means a more efficient use of fuel, the full boiler capacity, long life of the boilers by maintaining them in such condition that the metal is not continually injured by overheating, and it means reduction in repairs and labor. In fact it would seem to be one of the most essential features of a boiler plant in these days, when economies in the cost of production often represent the profits in a manufacturing business.

The Production of Bessemer and Basic Iron in 1906.

The production of pig iron in the United States in 1906 by States, as shown by the statistics of the American Iron and Steel Association, was given in these columns last week. Some further details will be of interest, particularly those relating to the production of Bessemer and basic pig iron by States and the distribution of production according to fuels. The production of coke and anthracite pig iron by States was as follows:

Production of Coke and Anthracite Pig Iron.—Gross Tons.

	First half of 1906.	Second half of 1906.	Total for 1906.
New York	746,271	806,388	1,552,659
New Jersey	167,820	211,570	379,390
Pennsylvania	5,687,717	5,557,489	11,245,206
Maryland	193,498	191,802	385,300
Virginia, North Carolina, Georgia and Texas	293,124	257,203	550,327
Alabama	814,440	834,578	1,649,018
West Virginia	136,662	167,872	304,534
Kentucky	34,580	61,365	95,945
Tennessee	203,035	221,306	424,341
Ohio	2,674,137	2,647,546	5,321,683
Illinois	1,011,639	1,145,227	2,156,866
Michigan and Wisconsin	175,673	178,718	354,391
Minnesota, Missouri and Colorado	235,932	218,592	454,524
Totals	12,374,528	12,499,656	24,874,184

The production of charcoal iron in the various States in 1906 was as follows. The total for Georgia, Texas, Kentucky and Tennessee includes 500 tons made in Georgia with charcoal and coke mixed:

Production of Charcoal Pig Iron by States.—Gross Tons.

	First half of 1906.	Second half of 1906.	Total for 1906.
Massachusetts and Connecticut	10,218	10,021	20,239
Pennsylvania	1,026	1,637	2,663
Maryland and Virginia	2,727	2,176	4,903
Alabama	10,650	15,180	25,830
Georgia, Texas, Kentucky and Tennessee	11,716	15,302	27,018
Ohio	1,675	3,775	5,450
Michigan	137,031	144,337	281,368
Wisconsin, Missouri and Oregon	32,679	32,857	65,536
Totals	207,722	225,285	433,007

The production of pig iron in the various districts of Pennsylvania and Ohio was as follows, ferromanganese and spiegeleisen being included:

Production of Pig Iron in Pennsylvania and Ohio.—Gross Tons.

Districts.	First half of 1906.	Second half of 1906.	Total for 1906.
Pennsylvania:			
Lehigh Valley	333,179	311,911	645,090
Schuylkill Valley	352,599	361,847	714,446
Lower Susquehanna Valley	334,526	337,768	672,294
Juniata Valley	106,794	89,719	196,513
Allegheny County	2,856,327	2,846,394	5,702,721
Shenango Valley	1,026,306	920,873	1,947,179
Miscellaneous coke	677,986	688,977	1,366,963
Charcoal	1,026	1,637	2,663
Ohio:			
Mahoning Valley	949,222	987,714	1,936,936
Lake counties and Hocking Valley	744,139	734,591	1,478,730
Miscellaneous coke	774,734	728,058	1,502,792
Hanging Rock coke	206,042	197,183	403,225
Hanging Rock charcoal	1,675	3,775	5,450

The production of Bessemer and low phosphorus pig iron in the various States was as follows, the figures for Pennsylvania and Ohio, which produced respectively 6,360,694 and 3,870,204 tons, being given by districts. The total of 13,840,518 tons compares with 12,407,116 tons in 1905, an increase of 11.5 per cent:

Production of Bessemer and Low Phosphorus Pig Iron.—Gross Tons.

	First half of 1906.	Second half of 1906.	Total for 1906.
New York and New Jersey	376,271	413,731	790,002
Pennsylvania:			
Lehigh and Schuylkill valleys	67,122	80,025	147,147
Lower Susquehanna Valley	267,184	289,016	556,200
Allegheny County	1,904,927	1,882,391	3,787,318
Shenango Valley	712,010	610,118	1,322,128
Miscellaneous coke	269,412	278,469	547,881
Charcoal	0	20	20
Maryland and Virginia	193,498	186,825	380,323
West Virginia, Tennessee and Kentucky	141,741	200,925	342,666
Ohio:			
Mahoning Valley	710,597	741,246	1,451,843
Lake counties	601,843	587,658	1,189,501
Hanging Rock coke	73,849	51,781	125,630
Miscellaneous coke	541,055	562,175	1,103,230
Illinois	817,182	859,640	1,676,822
Michigan, Wisconsin and Minnesota	91,190	76,798	167,988
Colorado	117,000	134,819	251,819
Totals	6,884,881	6,955,637	13,840,518

The production of basic pig iron was as follows by States. The total, 5,018,674 tons, is an increase of 22 per cent. over that for 1905, which was 4,105,179 tons:

Production of Basic Pig Iron, Not Including Charcoal Iron.—Gross Tons.

New York and New Jersey	118,536	145,411	263,947
Pennsylvania:			
Allegheny County	845,780	874,059	1,719,839
Other counties	831,351	811,132	1,642,483
Virginia and Alabama	267,379	302,593	569,972
Ohio, Illinois, Missouri and Colorado	386,229	436,204	822,433
Totals	2,449,275	2,569,399	5,018,674

The production of spiegeleisen and ferromanganese in 1906 amounted to 300,500 tons, distributed as follows: Pennsylvania, 195,825 tons; New Jersey, Maryland, Illinois and Colorado together, 104,675 tons. The total for the first half of the year was 160,833 tons and for the second half, 139,667 tons.

A large crane recently completed at the Elswick Ordnance Works of Sir W. G. Armstrong, Whitworth & Co., Limited, is similar to the ordinary jib type, and is designed to lift 150 tons at a radius of 90 ft. In tests 200 tons was easily raised. The pedestal spanning the railroad running along the quay stands on four columns, built up of plates, and measures 38 ft. by 45 ft. across the corners. The foundations are carried on piles driven through the bed of the river. The upper part of the crane rotates on rollers, the external diameter of the roller path being about 38 ft. All the motions, rotating, hoisting, and raising the jib are performed by hydraulic power. The crane is intended for handling guns and their mountings and for general use in completing large warships. Owing to the increasing size and breadth of modern vessels, the shear legs hitherto used for this purpose have not sufficient reach over the water. A second pulley is provided for 25-ton lifts at the extremity of the jib at a radius of 115 ft.

The Bessemer Coal & Coke Company, Pittsburgh, Pa., has elected Fred Rowe, president, George H. Love vice-president, E. N. Love secretary and treasurer and G. H. Love, J. G. Lange and George M. Hosack directors.

The Approved Combination Water Gauge and Automatic Safety Valves.

The danger attending the breaking of a water gauge on a steam boiler is too well known to need any comment. The means to guard against the breaking of the glass are many, simplest of all being the placing of guard wires around the glass, and the most recent one an inclosing heavy glass tube. None of these, however, are any protection after the gauge glass is broken. A new safety device, and probably the first to remove disastrous consequences if the glass is broken, is the Approved combination water gauge and automatic safety valves, patented and manufactured by the Northern Specialty Company, Incorporated, Utica, N. Y. Illustrations of the gauge and details of its important parts, the safety valves, are given herewith. The protective principle is that this valve will close automatically and instantly when pressure equilibrium on its opposite sides is destroyed; in other words, when the gauge glass breaks and the pressure on the side away from the boiler is reduced to atmospheric. It avoids the scattering of the broken pieces of glass with force sufficient to do injury and cuts off escaping steam instantly, which heretofore had to be done by hand valves at a considerable risk to the fireman. The apparatus is applicable to boilers on locomotives and steam vessels or stationary boilers used in heating and power plants, and is tested to 700 lb. hydrostatic pressure and 300 lb. steam pressure.

Fig. 1 shows the complete appliance. Fig. 2, a vertical longitudinal section through the upper combination valve, shows the normal position and function of the inside parts. The object of the combination valve is to combine the water gauge and automatic safety valve in a single casting, preserving the function of each, but enabling it to be connected directly to a boiler or water column with a saving of space and eliminating of several connecting parts. The two safety valves at the top and bottom of the glass are constructed so that they are closed only by steam and water pressure when the equilibrium of pressure in the gauge glass is destroyed, and will open automatically as soon as a new glass has been inserted and the boiler pressure again equalized. To permit the safety valve to open automatically a slow speed on the disk of each valve allows the gauge glass to fill in 5 to 8 min., which takes away the danger of breaking a new gauge glass while filling it, and allows the valve to open by gravity to the position shown in Fig. 2. By means of a wheel or bar chain, as shown in Fig. 1, on the side of each valve, the valve can be forced to open position as shown in Fig. 2. With this arrangement the valves close automatically, open automatically, or may be forced open, but they cannot be forced shut by any external manipulation, thereby guarding against ignorance, carelessness and the possibility of a false water level.

Fig. 3, a vertical cross section on the line A A of Fig. 2, shows the disk of the safety valve in its normal open position in one chamber of the combination. It shows how it swings on a hinge pin, which is operated either by a hand wheel or a bar and chain. A shoulder on the hinge pin, which abuts a like shoulder on the valve hinge, allows the disk of the valve to be forced

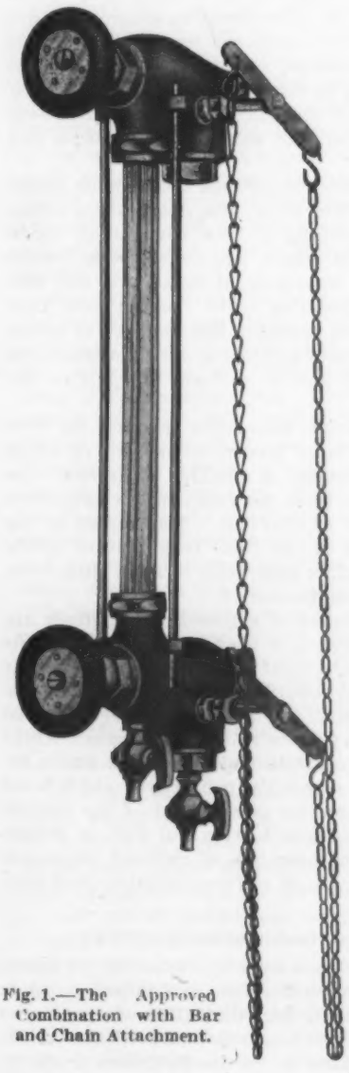


Fig. 1.—The Approved Combination with Bar and Chain Attachment.

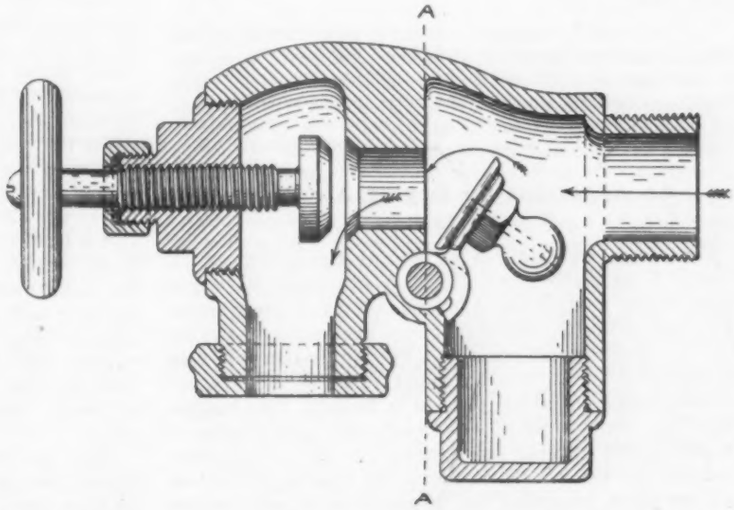


Fig. 2.—Vertical Longitudinal Section through the Upper Combination Valve.

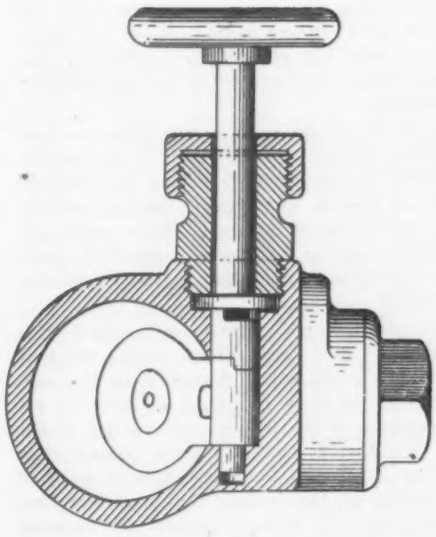


Fig. 3.—Cross Section on the Line A A of Fig. 2.

away from its ground seat when closed to the position shown in the sectional views. A port or opening is made through the valve hinge, as shown in Fig. 3, which is blown through each time a gauge glass is blown down. The chains for opening the safety valves are used where the gauge glass is out of the fireman's reach, and are manipulated only when it is desired to hold the valves in the open position while blowing down the water gauge.

The automatic safety check valves are also made separately, so that they may be used in connection with any water gauge already installed on a water column or boiler. They are essentially the same in construction. They are made of heavy brass tested to 300 lb. steam presure, and are to be had with male and female threaded ends or flanges.

A particularly valuable feature of both devices is that they protect the boilers at all times whether an attendant is at hand or not. It is very often the case in many buildings that the boilers are left alone much of the time.

An Apparatus for Drying Air Blast.

A patent was granted at Washington December 25, 1906, to Giuseppe Cattaneo, Charlottenburg, Germany, and Julius Schlesinger, a citizen of the United States residing in Berlin, Germany, on an apparatus for drying air for metallurgical purposes. The application was filed January 9, 1905. The inventors refer to the dry air blast method in which the air is brought into contact with the surfaces of pipes through which cold brine is flowing, and suggest the expense of change-over provisions and the drawback due to the frost accumulating on the pipes, impairing the transmission of cold and increasing the resistance to the air by the narrowing of the free space between the pipes. It is claimed that the employment of several coolers to be used alternately, as well as the use of an auxiliary fan to relieve the blowing engine of the work of suction, is avoided by the method proposed, which is described by the inventors in substance as follows:

The new apparatus brings the air into direct contact with a cooled liquid in the form of rain. It has proved useful and practical for the liquid to have a temperature of from — 3 to — 5 degrees, as the lower the temperature the greater the extraction of moisture. It is preferable to employ a liquid having hygroscopic qualities, such as a solution of chloride of magnesium, chloride of calcium or chloride of sodium.

The air is passed through a chamber in which it is exposed to a shower of the cold alkali in the form of rain. The moisture in the air is deposited on the surfaces of the falling particles of liquid, as well as absorbed in consequence of the hygroscopic quality of the brine, so that the drying action is more intense than where the cooling is effected indirectly by the walls of pipes. The freezing of the cooling liquid at low temperature is prevented by a suitable content of the salts. While the resistance offered to the air on its passage through a cooler provided with cooling pipes increases in consequence of the continually growing layer of rime, the resistance, when using a shower of liquid as a means for cooling, remains always equally low. Cooling by means of a shower of liquid permits the work to be continuous without the use of change-over devices, as the moisture in the air is continually taken up by the brine, so that it is necessary merely to concentrate the solution again, which can be done without interrupting the running of the plant.

The Baldwin Locomotive Works, Philadelphia, finished its thirty thousandth locomotive on February 8, and a pennant was hoisted to mark the event. The works were established in 1831 and took one year to build the first locomotive. It weighed five tons. The thirty thousandth locomotive has been built in less than three months and it weighs 289,000 lb.

Electric Motors vs. Steam Locomotives.*

The Cost of Electricity for All Railroads of the United States.

BY LEWIS B. STILLWELL AND HENRY ST. CLAIR. PUTNAM.

Three-phase and single-phase alternating current railroad motors are now developed to a point where they fairly challenge the steam locomotive, even in long haul freight service, in which class of work the direct current motor hitherto has found itself unable to compete with success. The direct current motor has demonstrated impressively, and upon a large scale, its superiority to the steam locomotive, not only in operating single cars and short trains on lines of moderate length, but also in frequent and heavy passenger service in which the length of train is limited only by the length of station platform, while the motive power equipment far exceeds in power developed the limits hitherto established in steam passenger service.

On the Valtellina line and through the Simplon tunnel 70-ton electric locomotives with three-phase motor equipment, capable of developing a draw bar pull of 28,000 lb., have displaced the steam locomotive, with results showing both marked improvement in service and substantial economy in operating costs. In the New York Subway eight-car trains weighing 320 tons are in operation, equipped with motors developing during acceleration a tractive effort equivalent to a draw bar pull of 55,000 lb.

The heaviest passenger locomotive used on the Erie system weighs, exclusive of tender, 206,000 lb., of which 55.8 per cent., or 115,000 lb., is effective on drivers. Assuming the adhesion to be 20 per cent., such a locomotive exerts a drawbar pull of 23,000 lb. The motors of the eight-car electric train of the New York Subway therefore exert a tractive effort equivalent to more than twice the drawbar pull of this locomotive.

Managers and engineers of railroads using steam are considering the possibilities of electricity. Naturally the problem usually presents itself in reference to particular cases in which special conditions emphasize the advantages of electric traction; but a point has been reached in the development of electric railroad equipment where it is evident that no absolute and permanent limits beyond which the motor may not go can be fixed, and it is not unreasonable to consider the possibilities of the electric motor not only in passenger service, but also in freight service, not only in the operation of railroad terminals, but also for the operation of railroad divisions and even for trunk lines.

High Speeds Attainable with Electricity.

The possibilities of operating by electricity at speeds exceeding the maximum which can be obtained safely in steam operation, owing to the elimination of unbalanced reciprocating parts of the locomotive, is well known. It was strikingly illustrated in the Berlin-Zossen trials by the attainment of a speed exceeding 130 miles an hour. These tests demonstrated the ability of electric equipment to operate at a sustained speed more than twice as great as that of our fastest express trains on runs of any considerable length, and exceeding by about 50 per cent. the maximum which can be attained even for a short distance by the steam locomotive with a reasonable degree of safety.

Even at speeds at which steam locomotives may be operated without great danger of leaving the track, as a result of the effect of unbalanced reciprocating parts, electric engines are far better able to maintain speed while drawing heavy trains. At speeds of 80 or 90 miles an hour, for example, it is extremely difficult to operate with satisfactory results two steam locomotives at the head of the train; while multiple unit control places any necessary number of locomotive units absolutely and instantly responsive to the will and touch of a

* Extracts from a paper read before the American Institute of Electrical Engineers, New York, January 25, 1907.

single operator. At high speeds, also, the economy of the steam locomotive falls off rapidly, while that of its competitor remains practically constant.

The increase in average speed resulting from the relatively high acceleration obtainable in the use of multiple unit electric equipment in service where stations are very close together, *e. g.*, elevated and subway lines in cities, and in suburban service in the vicinity of large cities, is well understood.

Steam and Electricity on Elevated Trains.

Interesting evidence as to the relative reliability of steam locomotives, and of electric motors carried upon cars and controlled by the multiple unit system of train control, is derived from records of the Manhattan Division of the Interborough Rapid Transit system of New York. Upon the elevated lines steam locomotives were used from 1872 until 1902, during which year and a part of the following year, electric equipment was gradually substituted. The locomotives were operated under exceptionally favorable conditions, were not overloaded, were of simple construction, and admirably maintained. The electric equipment that succeeded them is operating trains which average 5.3 cars as against 3.8 cars in the days of steam operation. The average speed is materially higher. The tractive effort during acceleration of a six-car train is 30,000 lb. as against a maximum draw bar pull of approximately 7000 lb. exerted by the steam locomotive.

Marked gain in reliability of service has resulted from the adoption of electricity. For five months of steam operation, November, 1900, to March, 1901, the aggregate car mileage was 18,527,773 miles, and the aggregate delay 8258 train minutes. The car mileage per train minute delay was 2243. For the corresponding period of electric operation, five years later, the car mileage was 25,482,081, the aggregate train minute delay 5970 and the car mileage per train minute delay was 4268. The months involved in the comparison are those in which the difficulties of operation, owing to weather conditions and number of passengers transported are at a maximum. Snow and sleet are among the greatest difficulties to be overcome in the operation of a third rail system, when, as in the case of the Manhattan, the third rail cannot be effectively protected by reason of limitations in space available on the structure. In view of these difficulties and of the increase in density of traffic the results obtained are remarkable.

Decreased Operating Cost with Electricity.

According to our estimate if all the railroads of the United States were to-day operated by electricity, using the single-phase alternating current system at the potential adopted for the equipment of the New Haven Railroad, the energy required for operation being developed by power plants, such as are to-day in extensive use, and transmitted at potentials well within limits established in practical service, and if the rolling stock equipment consisted of locomotives and multiple unit trains fitted with motors and control apparatus no better than the best which now exist, the aggregate cost of operation, which in 1905 amounted in round numbers to $1,400,000,000, would be reduced by about $250,000,000.

To accomplish this result power plants delivering about 12,500,000,000 kw.-hr. per annum would be required. Assuming the radius of transmission from power houses to be 150 miles the load factor in railroad service should be not less than 0.75, and taking this figure it appears that power plants capable of delivering a maximum output of about 2,800,000 kw. will be sufficient to operate the entire railway service of the United States as existing in the year 1905. The average output required is about 10 kw. per mile of line and 7 kw. per mile of track.

In 1905 the average gross earnings of our railroads per mile of line were $9598, and the average operating expenses $6409. Our calculations lead to the conclusion that high class electric equipment now available would reduce this average cost to $5265. The difference is $1144 per mile of line, against which apparent saving must be charged the annual interest and depreciation of the power plant, the addition to permanent way equipment, comprising overhead construction and track bonding, the transmission circuits, and the substations with their equipment. Assuming 5 per cent. interest on cash cost of these items and allowing 5 per cent. for a sinking fund to cover depreciation of power house, with its equipment, and 2½ per cent. for a sinking fund to cover depreciation of the overhead construction and distributing system, the aggregate of fixed charges works out at $837 per mile of line. The saving in operating expenses, therefore, is more than sufficient to take care of the increase of fixed charges. In other words, it appears that the entire railroad system of the United States could be operated to-day at less cost by the electric motor than by the steam locomotive. That the railroads in general if so equipped would realize a large increase in earning power will be admitted by all who have given the subject intelligent attention.

While our estimates have led us to the conclusion that, under average existing conditions of railroad operation in the United States, improved financial results would be attained by the substitution of the electric motor for the steam locomotive, the immediate and general adoption of the new motive power by our railroad companies is neither possible nor desirable. It requires no argument to demonstrate the wisdom of making haste with deliberation in a matter involving interests of such magnitude as those which are tied up with the transportation systems of the United States. Recognizing the magnitude of these interests and having in mind the fact that the art of electric traction as applied upon a large scale to heavy train units is yet young, the point which we desire here to emphasize is the necessity of conservative and carefully considered action upon the part of all who may be called upon to advise in respect to the electrification of railways now operated by steam.

Cost of Electrical Equipment for All Lines.

In order that the question raised may be looked at in proper perspective the following estimates will be useful:

For the equipment of the entire railroad system of the United States as now existing an aggregate power house output capable of supplying continuously 2,100,000 kw. would be required. Of the electric apparatus installed in the power houses, a change in frequency affects the generators, transformers, and a large proportion of the measuring and indicating instruments. It also affects the cost of the engine or turbine employed to drive the generator. At 25 cycles, the apparatus affected by frequency should cost approximately $30 per kilowatt. At 15 cycles it would cost on the average perhaps $33 per kilowatt. Cost of substation transformers would be increased approximately one-third, and in round numbers the total cost of turbines and electrical power house and substation apparatus would be increased from $70,000,000 to $80,000,000.

If it be assumed that one electric locomotive will do the work of two steam locomotives, about 24,000 electric locomotives would be required to take care of the present railroad business of the country. Assuming the cost of the average electric locomotive to be $25,000, the aggregate cost of locomotives required would be $600,000,000. Allowing for the increased cost of the 15-cycle transformers, it would seem that the difference in cost of the average locomotive should be not less than $1000 in favor of the lower frequency, or for 24,000 locomotives $24,000,000. This is more than twice the estimated difference in cost of power house and substation equipment.

It seems entirely safe to say, therefore, that the aggregate first cost of electric equipment and of steam turbine will be decreased by a change from 25 cycles to 15 cycles. The operating cost will obviously be decreased very materially. At least three-fourths of the above estimated cost of electric locomotives, say $450,000,000, represents cost of electric equipment. It will be seen, therefore, that of the apparatus which our electrical manufacturing companies may be called upon to furnish, more than 85 per cent. is rolling stock. Obviously, any argument in favor of 25-cycle equipment which may rest upon existence of drawings and patterns and convenience in manufacturing should have comparatively little weight.

The use of 15 cycles instead of 25 cycles also secures considerable advantage in respect to the overhead trolley conductor and track return. With a given limit of voltage drop, this advantage may be utilized by reducing size and, consequently, the cost of the overhead copper and the copper used to reinforce the track return.

Under the plans which we have assumed as a basis of our calculations, the amount of copper required for feeder circuits, trolleys, and reinforced track return, estimated at 20 cents per pound would cost approximately $750,000,000 were the entire railroad system of the country as existing in 1905 to be equipped for electric operation.

Progress of Electrification in 1906.

B. J. Arnold addressed the annual meeting of the Western Society of Engineers at Chicago, January 8, on "The Progress of Electricity on Steam Roads in 1906." Brief reference was made to the acquisition of parallel electric roads by steam roads and to the more familiar work under way or planned in the East, including the electrification of the New York Central terminal at New York City, the Pennsylvania Railroad tunnel work, the Hudson & Manhattan and the New York & Jersey Company's tunnels, the New York, New Haven & Hartford electrification work and the West Jersey and Seashore line of the Pennsylvania. Referring to other projects and actual construction of which not so much has been heard, the speaker gave the following:

SOUTHERN PACIFIC AND GREAT NORTHERN.

The Southern Pacific has plans for electrifying about 20 miles of its suburban steam lines at Oakland, Cal. The equipment of the Cascade division of the Great Northern Railway, over the Cascade Mountains, a distance of about 100 miles, although not yet definitely decided, is contemplated. Its equipment would eliminate the use of steam locomotives now operating over a tortuous piece of road, and through a long and difficult tunnel. Electrification is also contemplated upon a division of the Southern Pacific Railway, through the Sierra Nevada Mountains, for the purpose of eliminating the difficulties due to tunnel operation, and of increasing the capacity of the road, which is now limited by the size of the present steam locomotives.

THE ST. CLAIR TUNNEL OF THE GRAND TRUNK.

Displacing steam locomotives in the St. Clair tunnel of the Grand Trunk Railway, lying between Port Huron, Mich., and Sarnia, Ont., the officials of that company decided a little over a year ago to adopt electrical propulsion. The single-phase system was adopted for several reasons, the principal one being the objection to the use of the third rail in the yard at each end of the tunnel, which was quite extensive, and in which much switching had to be done in making up trains before entering the tunnel. The equipment will consist of six electric locomotives, weighing 120 tons each, having a normal capacity of 1500 hp., capable of exerting a draw bar pull of 25,000 lb. at a speed of 10 miles per hour, and a maximum speed for passenger train service of 35 miles per hour. The power station, which is now well under way, will contain two 1250-kw. turbo generators, either one of which will be capable of operating the tunnel up to its full capacity, the other being held in reserve.

IMPORTANT PLANS OF THE ERIE ROAD.

The Erie Railroad has a commmission organized for the purpose of electrically equipping its lines, now running out of Jersey City, a total of about 250 miles, although it is contemplated that but 35 miles will be immediately equipped, comprising the division extending from Jersey City to Greenwood Lake. In addition to its suburban lines in the vicinity of Jersey City and its terminal, the road now has under construction 34 miles of single track, known as the Rochester Division. This division lies between Rochester and Avon, N. Y., with a branch between Avon and Mt. Morris. The single-phase alternating current system will be used, having a working pressure of 11,000 volts on the overhead conductor. The energy will be secured from Niagara Falls at a pressure of 60,000 volts. Six passenger coaches, each 54 ft. long, and seating 56 people, will be placed in service, each car weighing about 50 tons and equipped with four 100-hp. motors. These cars will be capable of a maximum speed of from 45 to 50 miles per hour and of hauling one trailer. While this extension of the Erie is short, the company has under contemplation the electrical equipment of its entire suburban service surrounding Jersey City, which will involve an expenditure of some $15,000,000. Plans are now being formulated for this expenditure.

A WEST SHORE LINE 44 MILES LONG.

An important piece of equipment for electrical operation is now under construction by the West Shore Railroad between Utica and Syracuse, N. Y. The work in hand covers a distance of 44 miles, and the passenger schedule provides for limited trains in each direction, making the distance from terminal to terminal in 1 hr. and 22 min. The relative merits of alternating current overhead equipment and third rail direct current equipment were carefully considered, and the decision to install the direct current system was largely determined by the general flexibility of a third rail equipment should it become desirable to make lateral extensions, install additions, side tracks, &c. Over certain sections of the line traffic conditions require that two additional tracks be built. These tracks will enable the passenger trains operated electrically at 55 and 45 miles an hour to avoid interference with freight trains operated by steam—fast freight trains with a schedule of about 25 miles an hour, and local freight with a schedule of about 15 miles an hour.

Construction work was started on May 15 and is well under way at the present time. Electric power will be furnished by the Hudson River Electric Power Company, which will deliver three-phase, 60,000-volt current at the railroad company's sub-station 7 miles west of Utica. The Hudson River Company will generate this current for the present at its auxiliary steam plant in Utica, but upon the completion of its contemplated transmission lines current will very likely be taken from the hydro-electric plants owned by the company in the eastern part of the State. There will be four sub-stations located about 10½ miles apart. These will be identical in construction and each will be equipped with two 300-kw. rotaries and the necessary apparatus for transforming 60,000-volt three-phase current to direct current for distribution to the rails at 600 volts. The transmission line towers will be of steel. There will be 391 towers, with normal spacing of 480 ft. Most of the towers are 39 ft. high, the highest being 63 ft. The line conductors will be located at the vertices of an equilateral triangle 7 ft. on a side. The third-rail construction is the Wilgus under running protected type, this being the standard adopted by the New York Central. The third rail is located between the parallel tracks except where curves or other special conditions require it to be transferred to other sides of the track. The company will operate 15 closed cars, 49 ft. over the bumpers, each equipped with four 75-hp. motors per car and multiple unit control.

THE SPOKANE & INLAND.

The Spokane & Inland is a single-phase line between Spokane, Wash., and neighboring cities, having a total of 114 miles. The capital invested in the project is approximately $3,500,000. The service includes passenger, mail, express and carload freight. The power is purchased from the Washington Water Power Company and is delivered to the railroad company, as three-phase, 60-cycle current, at a frequency changing station 10 miles south of Spokane. This station has four frequency changers, each of nominal 1000 hp. capacity, which convert the current to 25-cycle, 2200-volt, single-phase current. For transmission to the substation this 2200-volt current is stepped up to 45,000 volts and transmitted to 15 substations, where it is stepped down to 6600 volts for direct connection to the trolley circuits.

The cars and locomotives operate on three different voltages at different parts of the line. In the country 6600-volt alternating current is used and in the smaller towns 700-volt alternating current, while within the limits of Spokane 600-volt direct current is used. In the coun-

try and through the small towns a pantagraph under running trolley is utilized, while in Spokane the ordinary under running trolley wheel is used. The passage from the alternating current to the direct current system is done by operating a commutating switch, which makes all necessary connections, and by changing the trolley fram the pantagraph to the wheel type. The cars are equipped with four 100-hp. alternating current motors. The locomotives use the same type of motors, but have a capacity of 150 hp. each. Both the locomotives and coaches may be operated on the multiple unit system. The locomotives are capable of handling seven standard freight cars, fully loaded at 30 miles per hour on level track. A locomotive weighs 49 tons and has a length over the bumpers of 29 ft.

EUROPEAN WORK.

Progress is being made on the tunnel work under the Seine for additional lines to the Paris Metropolitan Railway. The project for the tunnel under the English Channel between Calais and Dover has acquired a new interest and is a subject under much discussion. The proposed tunnels would be 18 ft. in diameter, the submarine portion being 24 miles in length, with approaches 6 miles in length, and, of course, would be operated electrically. This tunnel is designed to carry the rolling stock of the principal European railroad companies.

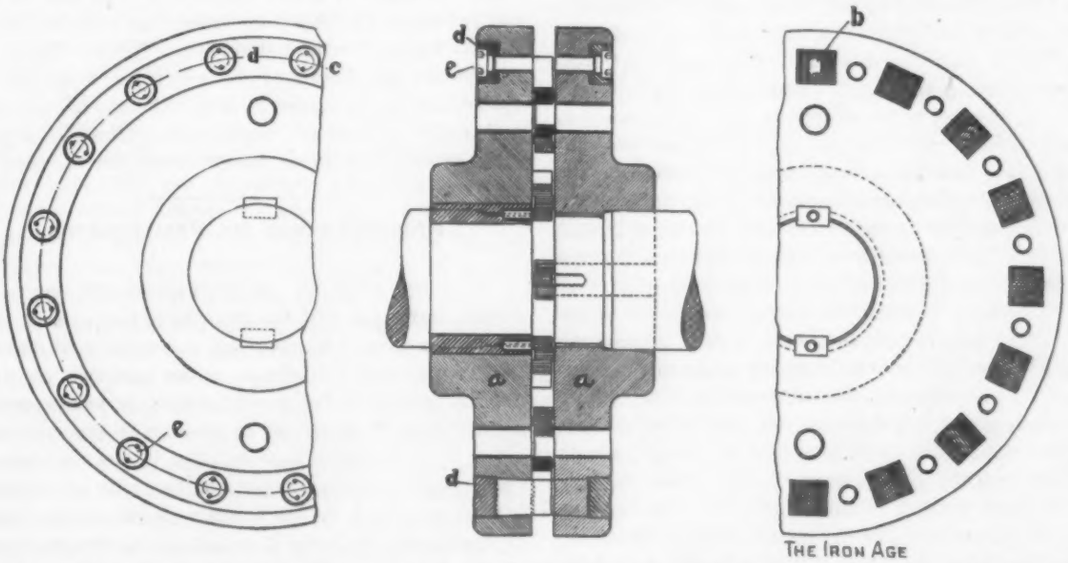
CHICAGO POSSIBILITIES.

From an examination of the map of the business district of Chicago, bounded by Sixteenth street, Halsted, Chicago avenue and the lake, it will be seen that 23 per cent. of this area is occupied by the tracks of the steam railroad companies. In view of the present state of the art of electric railroading the right to vitiate the air of our congested districts by the emission of large quantities of carbon dioxide from the stacks of the numerous locomotives is as questionable as the right to foul the air by the stenches from our stockyards. As there is now a possibility of the removal of these yards from our midst, is it unreasonable to hope that all of the steam railroad companies, through the wise foresight of their officers, may help to purify and beautify the city by assisting the general movement now under way by our progressive, civic bodies for this purpose? In my judgment, at least one and probably three of the companies now operating in the city of Chicago can afford to and would profit by the electrical operation of their suburban trains.

The Pickands-Magee Coke Company, Pittsburgh, has changed its name to the Pickands-Magee Company, and the capital has been increased from $100,000 to $200,000. W. C. Magee is president and treasurer; Harry Whyel, vice-president; C. L. Boyle, secretary; C. S. Bygate, general sales agent. The change of name was determined upon because it was thought the old name was misleading, seeming to indicate that the company was interested only in coke, while it also has extensive coal interests. Last year the sales of coal amounted to 200,000 tons, against 600,000 tons of coke. The company expects to handle at least 400,000 tons of coal, and 1,000,000 tons of coke this year.

The Hamilton-Holzwarth Flexible Coupling.

The flexible coupling used on the Hamilton-Holzwarth steam turbine, built by the Hooven, Owens, Rentschler Company, Hamilton, Ohio, is interesting because it suggests means for the direct coupling of any two independent machines whose shafts it is difficult to exactly align, or where one or both shafts must be allowed slight axial play. In large units the turbine is built with two casings, the shafts and running wheels of the high pressure and low pressure parts revolving in separate housings. Each of the casings is fastened at its low pressure end to the bed plate, so that it can expand axially against the steam flow. The shafts are independent and are connected by the flexible coupling. Similarly the whole turbine is connected with the generator, or whatever it may be driving by another flexible coupling. These couplings allow the shafts independently to expand axially, and in a slight degree they may even move radially without affecting each other.



Details of the Flexible Coupling Used on the Hamilton-Holzwarth Steam Turbine, Built by the Hooven, Owens, Rentschler Company, Hamilton, Ohio.

The illustration gives a cross section through the coupling and part views of the reverse sides of one of the coupling disks, both disks being alike. In this illustration *a* and *a* represent these similar disks, which are screwed and keyed to the ends of the shafts. In the facing surfaces of the two disks rectangular tapered slots *b* are cut, these being arranged in a circle with a uniform distance between them. In the opposite side of each disk an annular groove, *c*, is formed. The slots *b* are filled with thin steel laminations, forming a flexible brush in each slot. The annular ring *c* forms a receptacle for the coupling ring *d*, which is held in place and secured rigidly to the coupling disk by the screws *e*. This ring holds the laminated brushes securely in the coupling disk by wedging them into the tapered slots.

Two brushes on one disk engage between them one brush on the other, and on each disk pairs alternate with individual brushes, thus securing a positive connection between the coupling disks for turning in either direction. It will readily be seen that the two coupling disks can easily move axially, and that the flexibility of the lamination brushes even allows a slight movement radially. Such a flexible coupling as this makes it much easier to erect two independent machines intended to run at high speed.

THE IRON AGE

1855—1907.

New York, Thursday, February 14, 1907.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY, ... PUBLISHER
CHARLES KIRCHHOFF, ... } EDITORS
GEO. W. COPE, ... }
A. I. FINDLEY, ... }
RICHARD R. WILLIAMS, ... HARDWARE EDITOR

Railroad Freight Rates.

The postponement for a month of the proposed advance in freight rates on pig iron by Southern railroads was an eminently proper thing to do. From one point of view the railroads would have been justified in carrying out their original programme of advancing rates February 1. They are bearing a heavy burden of increased cost of operation, partly because of the advance in prices of nearly everything they buy and partly because of the higher wages they are paying their employees. They gave their patrons ample notice that freight rates were to be advanced, and the advance to be made was not unreasonable. But, from the viewpoint of the public, had the advance gone into effect on the date mentioned an injustice would have been perpetrated, as a vast quantity of pig iron which had been booked for delivery in January was held in Southern furnace yards because the railroads were too crowded with other traffic to move it. Whether the furnace companies or the buyers of pig iron would have been obliged to bear the advance in freight rates on deferred shipments has no bearing on this question, but it is obvious that equity would demand that any contract iron which under normal conditions would have been delivered in January should carry only the January rate of freight. Now that the railroads have yielded to the protests of shippers, they should be given due credit for their consideration of the rights of others. Unquestionably the railroads could have made a good defense for their action if their managers had been haled before the Interstate Commerce Commission. Their regard for the business interests of that section of the country with which they are identified was probably greater than their dread of an investigation by a railroad tribunal.

Unless a sharp restriction of general business takes place soon it seems inevitable that an advance in freight rates will not be confined to Southern pig iron. The railroads up to this time have borne with remarkable equanimity the advances in almost everything entering into their construction, maintenance and operation. With possibly the single exception of steel rails everything they purchase and every manufactured article hauled over their lines are bringing higher prices, and many of them much higher prices, than two or three years ago. The railroads have hitherto received their share of the general prosperity of the country through increased traffic, enabling their equipment and their facilities generally to be used to the extreme limit of capacity, which is a state of affairs always more remunerative than when facilities are but partially employed. But it is plainly to be seen that they now have to tackle the problem of how to maintain even reasonable net earnings in the face of greatly increased cost of operation. This problem admits of but one solution, and that is by an increase in freight rates.

The iron trade has a direct interest in this matter. At first blush, it may seem that the iron trade should strenuously oppose action of this kind, as it is also being burdened with an increasing cost of production. Raw materials have steadily grown dearer, and labor receives much higher remuneration than two or three years ago, with the possibility of further demands for advances. Higher freight rates on either raw materials or finished products would not be welcome by any means. But there is another consideration which must be borne in mind, and that is that the railroads are the largest consumers of iron and steel by far. It is to the interest of every manufacturer of iron or steel that the railroads shall continue to be liberal purchasers of supplies, equipment and construction material. Their purchasing power must be well maintained, so that they can freely add to their facilities, as they are always disposed to do when their earnings are satisfactory. The impairment of their purchasing power means the enforcement of economy, and when railroads economize the demand for iron and steel falls off seriously. The uses of iron and steel have broadened immensely in recent years, it is true, but we have not yet arrived at the point where the railroad demand can be regarded with indifference. Having due consideration for this feature of the iron trade, manufacturers should not be too eager to array themselves against a reasonable advance in freight rates. There is a possibility of muzzling the ox that treadeth out the corn.

Prosperity and Its Prolongation.

In every prognosis of business conditions in the United States for 1907 the crops have had a large place. Stress has been put upon the enormous conversion of free capital into fixed forms in the past two years and the inadequacy of the present supply of money to meet accumulating demands, not to mention all the menace imputed to Washington sources. Yet it has been granted that in spite of these things another year of prosperity will be assured if the earth again yields her increase on approximately the scale of recent years. But nearly two months must pass before the first period of crop uncertainty passes. Meantime much attention will inevitably be given to the course of the market for securities; not only because developments there will have to do with the floating of bonds, stocks or notes for the improvement programmes of the railroads this year, as well as with the amount and cost of money available for general business, but because of the record of Wall Street in forecasting industrial conditions.

It is the habit in some quarters to dismiss any untoward development in the stock market by saying that "Wall Street is the only blue spot in the country," also that the gamble in stocks is a law to itself and on no account may be made a gauge of legitimate business. Something of that sort was said with vehemence in 1903, when the securities market was declining, while industries were still driven to their utmost. Yet in the last quarter of 1903 and for three quarters of 1904 industry suffered from the malady that visited Wall Street in the second quarter of 1903 and prevailed there until the summer of 1904.

It is not stating the case adequately to say simply that Wall Street runs ahead of actual business conditions, whether of prosperity or the reverse. Unfortunately a greater proportion than ever of the business of the country is controlled by capitalists whose buying and selling are largely in securities. Therefore, while the minor fluctuations in the securities market are disre-

garded by the industrial interests of the country, the fact that any prolonged or decisive movement in that market will represent the views of important factors in the money market as to the outlook gives a significance to such a development that in these consolidation days will not be overlooked. In the present situation there is perhaps less unanimity as to the future than was evident one year ago or three months ago, the following from a current financial review presenting the impression of one trained observer:

> The camp of those who hold to the idea that prosperity is waning is growing in numbers rather rapidly. The argument most in favor on this side is the high level of all commodity prices, the aggressiveness of the Administration and the approach of the Presidential election—also the absence of investment demand for first-class securities.

Something is to be said in this connection as to the sort of prosperity the country has been having. For one thing, while it has been the most impressive demonstration ever given of the consuming capacity of the United States, it has been attended by the most persistent skepticism of its ability to endure. Not only has the prophecy of a change for the worse been reiterated from various quarters for more than a year, but in the present period of abundant business one wave after another has swept over the country, strong enough under ordinary conditions to carry away confidence and leave in its place distrust. The disappearance of such business confidence as is based on personal integrity was the serious menace of the disclosures of 1905; and the epidemic of attack that came later—the literary campaign against public officials and in turn the attacks of high and low officials on the corporations—would have turned any ordinary prosperity into a riot of pessimism and depression.

The fact is that the country has had prosperity in such an extraordinary and abnormal form as to make it well nigh a disease. It is a prosperity that has brought transportation and manufacturing to the breakdown stage. It shows the fever of congestion, and the disappearance of fever is generally regarded as a help and not a detriment. It would not necessarily be calamitous, therefore, if the business pulse should come to beat more slowly. But those who consider this a good time to test the value of various legislative prescriptions and to bear down upon great manufacturing and transportation organizations because they have had a period of large earnings, can easily get more than they bargain for. Sentiment is a powerful promoter or destroyer of business, and the point has been reached at which resistance to malign influences may not prove as strong as it has been in the past two years. Manufacturers in many lines would not complain if the strain should relax enough to permit of the restoration of shop discipline and of some attention to the economies of production. But they do not want the sort of meddling that will add to the shortness of money a further shortening of the supply of confidence.

Southern Railroads Inadequate.

In the South at the present time there is a very remarkable state of affairs. Many furnaces are weeks behind on their contract deliveries of iron, while they have the iron piled in their yards ready for shipment. The cause for this state of affairs is that the railroads are not able to furnish cars in which to move the iron, or, when they are able to furnish cars, the movement is so uncertain that there may be delays in transit exceeding a month. In fact, it is not unusual for consignees to receive cars that have taken from 30 to 100 days to travel from Birmingham to the Ohio River. There is nothing new in this, as the railroad situation in the South has been going from bad to worse, to put it plainly, for the last five years. As a rule the Southern roads are well managed, and possibly under the circumstances they are in some respects accomplishing marvels of transportation, but the trouble is that the South has far outgrown its railroad facilities. That section of the Union has been steadily expanding industrially and agriculturally, and the railroads that sufficed 10 years ago are now entirely inadequate to its necessities. Yet in that time the Southern railroads have practically stood still. The great trunk lines that lead from the North to the South—the Southern, the Seaboard Air Line, the Queen & Crescent, the Louisville & Nashville and the Illinois Central—are all single track lines. That is the secret of much of the trouble. The main lines of these railroads should be double tracked, and until that is done, or until more railroads are built, which is the other horn of the dilemma, the South will be held back. The great business interests of that section are therefore directly and most vitally concerned in bringing about such a change of sentiment toward railroad corporations that their securities may be regarded more favorably by investors.

The Woodworking Machinery Industry.

A great change is coming over the woodworking machinery industry in the increasing tendency of the larger establishments to reduce and simplify their lines. In the past most of the manufacturers of this class of tool have had a wide range of product, some of them having been able to furnish a complete shop equipment, even when this meant a great diversity of processes. Under these conditions it was hardly to be expected that improvements in such machinery would be developed as rapidly as if energies had been concentrated upon a few types of machine. The machine tool makers learned the wisdom of concentrating their product years ago, with results that speak for themselves, and the process of specialization has by no means reached its limit. The woodworking machinery builders have now made a good start in the same direction. In one instance whole lines of tools were wiped out.

Probably specialization cannot be carried to the same point as with the machine tool industry, excepting in small works where some one or two tools may profitably be built exclusively. In larger works there may be some exceptions, as, for instance, in the manufacture of complete saw mill equipment, though this is a line in itself more complex than any one type of machine tool as ordinarily manufactured on a large scale. American woodworking machinery has already made a place in the world correlating with that occupied by American machine tools, but there is the chance for its development to proceed more rapidly than ever before with a greater degree of specialization and with the better shop equipment which is a feature of the modern trend of the industry. It is fair to presume that foreign trade will grow in proportion to the change of conditions in the works.

The Internal Grinding of Small Diameters

Certain builders of grinding machinery are giving much attention to the internal grinding of small diameters, especially long holes, and believe they are overcoming some of the difficulties which had come to be regarded as insurmountable. The task deserves patient effort, for the amount of this class of work is considerable, though small compared with external grinding. For-

tunately the latter is not beset with the same difficulties that impede this other branch of the art. The greatest difficulties are the necessarily high spindle speeds to give the small abrasive wheel a peripheral speed of about 6000 ft. a minute, which is accepted practice, and the large arc of contact between the wheel and concave work. The necessary spindle speed has been found practicable by using rubber belting, the elastic tension of which counteracts the centrifugal force that tends to throw the belt away from the pulleys. Perhaps in time some new abrasive will be found which will successfully grind small internal diameters at low speeds, if the secret is not already revealed to those working on the problem.

Little progress has been made recently in this branch of grinding, although internal grinding of larger diameters has been highly developed, as has practically every other kind of grinding. Now it is to be hoped that the time is approaching when long, small holes may be ground accurately and in reasonable time. While the field for such a grinding machine or fixture will be somewhat limited, it will be nevertheless important. In many instances, where it would be thought a ground hole would tend to greater accuracy and efficiency the contrary is true, as when one part runs within the other, and too perfect a contact would make lubricating difficult. But in certain other places perfectly round and straight long holes may be utilized to great advantage to attain a perfection otherwise practically impossible.

CORRESPONDENCE.

The Determination of Phosphorus in Steel.

To the Editor: "The Analysis of Phosphorus in Steel," by H. E. Slocum in *The Iron Age* of January 31, has been noted with considerable interest. Through inadvertence probably, he has entirely omitted any reference to the previous publications of this well known practically identical method that has been in use in the laboratories of this region for almost 15 years. Leaving out the ancient history of the method previous to 1892, we find in Vol. 6, page 82, of the *Journal of Analytical and Applied Chemistry* a very complete article by C. E. Manby entitled "Phosphorus Determination by Neutralization of the Yellow Precipitate with Alkali." This was the first practical method along these lines. In the same volume of the *Journal*, page 204, just two months after the appearance of Mr. Manby's paper, J. O. Handy published a "Rapid Method for Phosphorus Determination in Iron, Steel and Ores." This paper was read at the first meeting of the Chemical Section of the Engineers' Society of Western Pennsylvania, and with the exception of the following details is identical with that of Mr. Manby. The latter washed the precipitate with a 3 per cent. nitric acid wash water, dissolved it in ammonia, evaporated the solution to dryness and roasted the residue to free it from ammonium salts. The standard alkali was then added. While Mr. Handy washed the precipitate with 1-10 per cent. solution of potassium nitrate to eliminate the acid before adding the standard alkali.

This method, published in April, 1892, and in use for nearly 15 years, is practically identical with that of Mr. Slocum, published last month, except in a few details which, as given by Mr. Slocum, rather detract from the accuracy of the method than otherwise, as will be shown by the following:

In shaking the indefinite 2 or 3 min. to precipitate the phosphorus, when good chemists who have used the method since its inception and proved the need, still insist on 5 min. shaking for complete precipitation. And in adding ammonia to produce ammonium nitrate and neutralize the excess of nitric acid, when by replacing the reducing salt of a fixed alkali (sodium nitrite) with a like salt of ammonium the reduction of manganese dioxide and the production of ammonium nitrate are simultaneous.

On the whole it is difficult to gather anything new or suggestive of improvement from Mr. Slocum's paper, and one wonders why it was written. THE WASH UP.

PITTSBURGH, PA., February 8, 1907.

To the Editor:—In your issue of January 31 H. E. Slocum, Pittsburgh, has an article on "The Analysis of Phosphorus in Steel," in which he says that after considerable experimenting he has worked out a method in which phosphorus can be determined with accuracy and rapidity. I wish to say that there is not a shred of originality in this method, but that it has been in use in American blast furnace and steel works' laboratories as far back as 1899. It was first brought to the attention of fertilizer chemists in the 90's by B. Kilgore, in a paper from the North Carolina Experiment Station on the determination of phosphoric acid in rocks and fertilizers. It was afterward used as an optional method by the Association of Agricultural Chemists. About 1898, J. Otis Handy, Pittsburgh, applied the alkalimetric method to pig iron and steel, dissolving in 1.13 HNO_3, oxidizing the phosphorus with permanganate and dissolving the MnO. produced by either ammonium bisulphite, sulphurous acid, cane sugar or hypo sulphite of soda or other reducing agent, neutralizing the excess of acid by ammonia and throwing down the phosphorus by the usual molybdate solution, filtering the yellow precipitate, washing with a neutral salt solution and finally dissolving the yellow precipitate in either sodium or potassium hydrate and titrating the excess of alkali with some mineral acid, either nitric or sulpnuric. Blair, in his excellent book on the "Chemical Analysis of Iron," 1901, and which may be found in any iron chemist's library, gives minute directions, almost identical. Also, Sutton's "Volumetric Analysis," 1900, contains the same directions for working phosphorus alkalimetrically. Mr. Slocum has therefore sprung a very old standby on us. He will find also that the shaking machine of Charles B. Dudley, chief chemist of the Pennsylvania Railroad, and whose method is identical with Slocum's, gives just as rapid results as the centrifugal machine.

RANDOLPH BOLLING,
Chief Chemist, Nova Scotia Steel & Coal Company.
NORTH SYDNEY, CANADA, February 7, 1907.

Motor Drive in Factories.—A factory equipped with a 550-volt induction motor is said, on the whole, to be safer to the employees than a direct current plant fitted with 500-volt motors. Even though a 550-volt alternating current carries with it a maximum of over 800 volts at the peak of the wave, there is more likelihood of trouble from the commutators and exposed contacts so often found in 500-volt direct current plants. With the latter, it is important that the switches and controllers be placed within the most convenient reach of the operators. In some of the more recent plants of this character it has been found necessary to protect these switches by insulated barriers, and it is difficult to secure all the flexibility desired without introducing the danger of serious shocks to the careless. Again, it is difficult to build very small, efficient motors for 500-volt circuits, on account of the requirements of insulation. The problem has been solved in some cases, but it is probable that a plant of the induction type, operating at 220 volts, would be preferable for small work.

The Republic Iron & Steel Company recently purchased the land formerly occupied by the plant of the Enterprise Boiler Company at Youngstown, Ohio, and will erect a large office building on the site.

The Bank of Pittsburgh, owner of $25,000 of stock in the Reese-Hammond Fire Brick Company, has asked for a receiver for the latter, whose fire brick plants are located at Bolivar, Pa.

Ferrosilicon Additions to Molten Cast Iron.

In *The Iron Age* of February 15, 1906, page 586, some account was given of the results secured by Alex. E. Outerbridge, Jr., Philadelphia, in the use of powdered ferrosilicon introduced in ladles of molten cast iron. Under date of February 5, 1907, a patent has been granted Mr. Outerbridge on the application of this method. Granting that it is not new to utilize ferrosilicon in the manufacture of cast iron, Mr. Outerbridge explains that his invention depends upon these characteristics—that the silicon compound shall be readily diffusible throughout the metal in the ladle at the temperature normally employed at that stage of foundry practice, also that the vehicle shall not substantially impair the resultant product.

Experience shows, it is stated, that additions of ferrosilicon in the cupola are not only wasteful of the ingredients, but result either in what may be considered a fixed product or, if varied during the heat, in a product the character of which cannot be predicted at a given moment of tapping. Referring to the suggestion that silicon be added in its elemental form to the iron in the ladle, it is stated that such silicon is not diffusible through the metal to any substantial extent, due apparently to the high melting point of silicon not associated with such a vehicle as in the case of ferrosilicon, or to the low specific gravity of "elemental" silicon, or both. The results attained by the addition of ferrosilicon and the method of using it are stated in the patent as follows:

"I can produce in the ladles themselves a great variety of grades of iron with respect to hardness, chilling properties, and other important characteristics, so that the general run of iron in the cupola need not be practically varied and may, moreover, be of what would be termed a 'low' grade, the necessary treatment to control the physical qualities being restricted to the relatively small quantity commonly used in a foundry ladle and the changes within the desired limits being immediately attainable. By this means I am enabled to cast from the same cupola charge small articles, such as pulleys, with rims, say, ¼ in. thick, soft enough to permit of machining and with negligible, chilling tendency, and heavy castings having, if desired, high chilling properties and close grained texture.

"In carrying out my process I proceed as follows: I may melt in the cupola iron of a character capable for the castings of the lowest grade to be made, which may have close grained texture and high chilling properties, and then tap into a ladle a charge sufficient for a particular casting or group of castings which it is desired to make of softer iron having but little chilling tendency. I then combine with the molten metal in the ladle a definite amount of a silicon compound in such form as to be thoroughly and quickly diffusible and without attendant additions which would impair the desired result. For this purpose I prefer to use powdered ferrosilicon containing a large proportion of silicon—say 50 per cent. of silicon—and I usually add it at the time of tapping of the metal into the ladle or soon thereafter in order to insure thorough combination. The casting is then poured in the usual manner. Other ladles may be tapped from the same charge and treated with different quantities of ferrosilicon, depending upon the qualities desired for the ultimate product.

"I have found that hard iron can be modified so as to produce a relatively soft gray iron by the addition of even so little as 1 lb. of 50 per cent. ferrosilicon to 200 lb. of iron, and that within certain limits the desired physical characteristics of the metal can be accurately controlled in correspondence with the percentage of the ferrosilicon thus added.

"I have named 50 per cent. ferrosilicon as the preferred ingredient to be practically used, because it affords the desired vehicle for the introduction of the silicon (which is the efficient agent) under such circumstances as are most favorable for the end to be obtained. If a low grade of ferrosilicon be added, (containing, say, only 20 per cent. of silicon,) the relatively large amount of iron contained in the addition tends not only to chill the contents of the ladle, but may in itself injuriously modify the total mass with relation to its intended purpose. Moreover, under these circumstances the addition does not exhibit the immediate and thorough diffusibility which characterizes the relatively high-grade ferrosilicon and which is essential for the practical conduct of the operation, since it will be noted that the addition is made after the cessation of the actual melting process and that the reaction must be effected during the period when cooling is taking place."

A New College Publication.

The School of Engineering of Colorado College, at Colorado Springs, Colo., has begun the issue of engineering numbers of the *Colorado College Publication*, one or more to be published each year, and to contain research work carried on by the faculty and students in that department. Wm. F. Slocum, president of the college, is editor-in-chief, and Florian Cajori, dean of the School of Engineering, managing editor.

The first issue in the engineering series contains two theses submitted to the faculty last June. One by L. C. Lennox and Chas. N. Cox, Jr., on "The Fusibility and Fluidity of Titaniferous Silicates," will be of interest to blast furnacemen, as it throws some light on the mooted question of the commercial usefulness of ores containing titanic acid. At present these ores are declined on account of their supposed tendency to form accretions in the hearth, in spite of the fact that they are rather abundant in the United States. The investigation reported was conducted to test the contention of A. J. Rossi of New York that the prejudice against titanium bearing ores is based on the early mistakes in handling them, and that it is perfectly feasible to obtain mixtures in the blast furnaces that would produce slags fully as fusible and fluid and in every way as satisfactory as those obtained when using ore free from titanic acid.

The tests were necessarily conducted on a small scale. It was easy to determine titanic acid in small quantities, but nearly a month was spent before a satisfactory method was found for its determination in large quantities. The paper explains this method, which must be exactly followed to be successful.

The conclusions from a study of the tests were that there is no difficulty in fusing any of the mixtures tried in the ordinary blast furnace, but their fluidity after fusion is still a question. The fluidity tests demonstrated that monosilicates are the most fluid, bisilicates and sesquisilicates quite viscous, and the trisilicates containing the higher percentages of $Ti\ O_2$ somewhat fluid. The fluidity almost invariably increased with an increase in $Ti\ O_2$, and the authors therefore believe that $Ti\ O_2$ in moderate quantities, if properly handled in a blast furnace, will give less trouble than heretofore supposed.

The second thesis, by Vernon T. Brigham, concerned "The Design of a Low Tension Switchboard," and described one of noteworthy convenience, developed in connection with the equipping of the laboratories of Colorado College.

The banking firm of Lawrence Barnum & Co., 27 Pine street, New York, is promoting through Thomas Latham of Cleveland, Ohio, the organization of a $20,000,000 combination for the consolidation of a number of coal mining companies in the Pittsburgh District. It is stated by the promoters that the following have entered the combination: Pittsburgh Rock Coal Company, Empire Coal Company, Belmont Coal Mining Company, Lorain Coal & Dock Company, M. A. Hanna & Co., Youngstown & Ohio Coal Company, Roby Coal Company, Jefferson Coal Company and the United States Coal Company. Mr. Latham has sent out a circular letter to various other coal producers stating that it is the desire of the promoters to consolidate a number of Pittsburgh mines, and asking an option on their properties.

At Pittsburgh the suit of the Chicago Pneumatic Tool Company against the Cleveland Pneumatic Tool Company, involving an alleged infringement of patents, was dismissed.

Woman and Child Labor.

Congress Cannot Regulate It in the States.

WASHINGTON, D. C., February 12, 1907.—The movement set on foot in Congress early in the present session having for its object the passage of a stringent Federal law for the regulation of woman and child labor, has caused no little anxiety among manufacturers in almost every industry. Several bills on the subject have been presented in both Houses, the passage of which would seriously hamper all manufacturers employing any but adult male operatives, those brought forward by Senators Lodge and Beveridge being regarded as the most drastic. Strong opposition has been encountered in both Houses, however, from Representatives and Senators who have claimed that the regulation of labor is an exercise of the police powers of government which belong exclusively to the States.

Opinion by Judiciary Committee.

With a view to settling this phase of the question the House recently adopted a resolution directing its Judiciary Committee to render an opinion as to "what extent and by what means Congress has authority to suppress abuses of such labor or to ameliorate conditions surrounding the employment of such laborers." After careful deliberation and much research the committee has made a report to the House holding that Congress has no authority whatever to legislate on this subject, which it is stated is wholly within the jurisdiction of the States.

The report discusses at length the power of Congress to regulate interstate commerce, upon which the contention that the Federal Government may control woman and child labor is based, and cites numerous court decisions to show that Congress cannot regulate in any way the products of manufacturers until they actually enter into interstate commerce.

"We look in vain," says the report, "over the list of enumerated powers granted Congress for jurisdiction and authority of Congress over the subject of woman and child labor. It has been suggested that the power exists under the commerce clause of the Constitution: 'Congress shall have power . . . to regulate commerce with foreign nations and among the several States and with the Indian tribes.' (Sec. 8, Art. 1.)

"When anything is desired it is readily asserted that the commerce clause is broad enough and elastic enough to permit any action by Congress that would relieve unfortunate conditions among the people. Unquestionably, it will be agreed that if Congress has jurisdiction and authority over the subject of woman and child labor, the power must be found in the clause of the Constitution cited; and if it cannot be found in that power, Congress has no authority or jurisdiction in the matter. The subject is governed by either the commerce clause of the Constitution or the police power of the States. The power to regulate commerce between the States and the police power of the States, that so often come in conflict between the States and nation, are not only separate and distinct powers, but must be exercised separately over the proper subject of the power for the purpose for which each power was created.

Scope of Police Power.

"Under the police power, the State cannot regulate interstate commerce; and under the commerce clause of the Constitution, Congress cannot interfere with the lives, health, property, good order, or morals of the State and its citizens. The police power of the State is a broad and extremely important power—a power to make all laws necessary and proper in the judgment of the Legislature for the good of the State and its citizens. The police power is embraced in what Chief Justice Marshall, in Gibbons v. Ogden (9 Wheat., 1), calls 'that immense mass of legislation which can be most advantageously exercised by the State, and over which the national authorities cannot assume supervision or control. . . . In recognition of this fundamental principle, we have frequently decided that the police power of the States was not surrendered when the Constitution conferred upon Congress the general power to regulate commerce with foreign nations and between the several States."

The report then takes up a number of decisions of the United States Supreme Court, including several of the so-called antitrust cases, and concludes as follows:

"It seems to be the unanimous judgment of the courts, whose opinion must prevail, that, under the Constitution, Congress is powerless to prevent a monopoly in manufacture, or control or regulate a manufacturer of products for interstate commerce shipment or the business or business matters of such manufacturer, agriculture, horticulture, stock raising, domestic fisheries, mining, or any other branch of human industry, or interfere with good order or public morals, lives, health, or property of citizens of the States (except in exceptional cases where jurisdiction is ceded by the States to the United States or an officer of the United States is interfered with in the discharge of some governmental duty, &c.), or limit or restrict the right to acquire, control, or dispose of property, or regulate the price at which property can be bought or sold, or make criminal the aims, purposes, and intent of persons in the acquisition and control of property.

No Jurisdiction Over Labor.

"Therefore, it plainly follows that Congress cannot even exercise any jurisdiction or authority over women and children employed in the manufacture of products for interstate commerce shipment; and certainly it will not be claimed by the foremost advocate of a centralized government that Congress can exercise jurisdiction or authority over women and children engaged in the manufacture of products for intrastate shipment.

"The fact is when the product is manufactured it is not known whether the same will be interstate commerce or intrastate commerce. It is not extreme or ridiculous to say that it would be just as logical and correct to argue that Congress can regulate the age, color, sex, manner of dress, hight and size of employees and fix their hours of labor, as to contend that Congress can exercise jurisdiction over the subject of woman and child labor.

"The jurisdiction and authority over the subject of woman and child labor certainly fall under the police power of the States, and not under the commercial power of Congress. The suggestion contained in the resolution shows how rapidly we are drifting in thought from our constitutional moorings. Undoubtedly it is the earnest wish of all who desire the prosperity of the nation that the proper line should always be drawn between power of the States and the power of the nation. Certainly there is no warrant in the Constitution for the thought or suggestion that Congress can exercise jurisdiction and authority over the subject of woman and child labor. If those performing such labor are abused, and conditions are such that the same should be improved, it rests for the States to act. The failure of the States to act will not justify unconstitutional action by Congress.

"Unquestionably Congress has the power to investigate conditions, ascertain facts, and report upon any subject. In the opinion of your committee, there is no question as to the entire want of power on the part of Congress to exercise jurisdiction and authority over the subject of woman and child labor.

"In fact, it is not a debatable question. It would be a reflection upon the intelligence of Congress so to legislate. It would be casting an unwelcome burden upon the Supreme Court so to legislate. The agitation of such legislation produces an uneasy feeling among the people and confuses the average mind as to the power of Congress and the power of the States. The lives, health and property of the women and children engaged in labor are exclusively within the power of the States, originally and always belonging to the States, not surrendered by them to Congress. Such is the emphatic language of the Supreme Court. If a question of good order and morals, it is the same. The argument has long since been made by others, and the committee cannot add to it. The assertion of such power by Congress would destroy every vestige of State authority, obliterate State lines, nullify the great work of the framers of the Constitution, and

leave the State governments mere matters of form, devoid of power, and ought to more than satisfy the fondest dreams of those favoring centralization of power.

Wise Division of Power.

"The National Government is too weak to undertake the exercise of the police power of the States. In a short time this great nation would be worse than a ship in midocean, in a great storm, without a rudder or compass. The division of power was wise and beneficial. Time, study and experience approve it, and we should not attempt in an unconstitutional way the destruction of the substructure of our Government. If, then, these two great powers of police and commerce are separate and independent, the power of the States sovereign, where is the authority for saying that Congress can invade and impair that power entire and independent in the States? The right and power of both the States and nation must be respected and upheld.

"The committee is of the opinion that Congress has no jurisdiction or authority over the subject of woman and child labor, and has no authority to suppress any abuses of such labor or ameliorate conditions surrounding the employment of such laborers."

The effect of this decision will be to put an end to the agitation in the House for legislation on this subject and, as the Senate can gain nothing by passing a measure foredoomed to failure, it is believed the movement will be abandoned, at least so far as this Congress is concerned.

W. L. C.

Shipbuilding Under the Subsidy Bill.

WASHINGTON, D. C., February 12, 1907.—Commissioner of Navigation Chamberlain has compiled an interesting statement showing the probable effect of the enactment of the pending shipment bill upon the shipbuilding industry of the country. The general impression throughout the country appears to be that the abandonment of the cargo subsidy feature of the measure has rendered it of little further interest to the shipyards and that the subventions which it provides would go either to existing steamship lines or to lines to be equipped with vessels already constructed. This impression, according to Mr. Chamberlain, is wholly erroneous, and the figures which he submits will be examined by shipbuilders and subcontractors in all lines with much interest.

New Vessels Required.

The full equipment of the mail steamship lines provided for by the bill, according to Mr. Chamberlain's figures, would involve the expenditure of more than $32,000,000 in the construction of approximately 26 vessels, ranging from 6000 to 12,000 gross tons each. The proposed lines thus equipped would provide the complete fortnightly service contemplated by the bill, but even should the service be executed on a monthly basis only for the first year, no less than 12 vessels would be required. It is estimated that the 26 vessels referred to would aggregate 216,000 tons, which at an average cost of $150 per ton would aggregate $32,400,000. Twelve vessels for a monthly service would involve a proportionate expenditure.

The proposed line from ports on the Atlantic Coast to Brazil on 16-knot vessels receiving a subvention of $600,000 per annum, according to Mr. Chamberlain, would require five ships of 8000 tons each, or an aggregate of 40,000 tons. The line from Atlantic ports to the Argentine, employing 16-knot vessels drawing $800,000 per annum, would require six vessels of 8000 tons each, or an aggregate of 48,000 tons. There is a stipulation in the bill that a vessel receiving compensation for mail service pursuant to contract on a voyage on the Argentine route shall not also receive compensation on the route to Brazil.

The third line authorized by the bill, between the ports on the Gulf of Mexico to the Isthmus of Panama by 14-knot vessels at a compensation of $150,000 a year would require two vessels, but suitable ships are already in existence, and this route, therefore, would not add to the shipbuilding requirements of the measure.

The line from ports on the Pacific Coast to Peru, Chile, &c., by 16-knot vessels at a compensation of $600,000 per annum would call for six new vessels of 6000 tons each, or 36,000 tons. This line would connect Pacific Coast ports with the Isthmus of Panama, as well as with the principal ports on the west coast of South America.

Lines to the Orient.

One of the most important lines in the bill is that projected to run from ports on the Pacific Coast via Hawaii to Japan, China and the Philippines, employing 16-knot vessels receiving an annual compensation of $700,000. It is generally understood, however, that one of the existing steamship lines would supply three of the five vessels required for this service, leaving two steamships of 12,000 tons each to be provided, or an aggregate of 24,000 tons. The line from Pacific Coast ports direct to Japan, China and the Philippines by 16-knot vessels drawing $700,000 per annum would require not less than six 10,000-ton ships, or an aggregate of 60,000 tons. There are no vessels available for this service, and Mr. Chamberlain regards his estimate of the requirements as decidedly conservative.

The line authorized by the bill, running from Pacific Coast ports via Hawaii and the Samoan Islands to Australasia on 16-knot vessels, will require three ships for the proposed service, but as a line is now operating two vessels on this route it is calculated that one additional vessel of 8000 tons would complete the equipment for a service once in three weeks at a compensation of $200,000 per annum in addition to that now paid the existing line under the mail contract law of 1891.

Summarizing these conclusions, Mr. Chamberlain presents the following table:

Service.	Vessels.	Individual tonnage.	Aggregate tonnage.
Brazil	5	8,000	40.000
Argentina	6	8,000	48,000
Panama	..	....	.....
Peru and Chile	6	6,000	36,000
Orient via Hawaii	2	12,000	24,000
Orient direct	6	10,000	60,000
Australasia	1	8,000	8,000
Totals	26	....	216,000

In preparing these figures Mr. Chamberlain has made a careful investigation of the condition and present service of all vessels that might be available for the projected lines, and has reached the conclusion that, aside from those already running on lines that would probably avail themselves of the proposed subventions, there are no ships in existence that would comply with the requirements. Even should a vessel here and there be withdrawn from the coatswise trade, which is now in a fairly flourishing condition, other vessels would require to be built immediately to fill the gaps thus created. Mr. Chamberlain has also been careful in estimating the tonnage of the ships required not to place it above that of vessels now performing similar service. In conclusion, he states with much emphasis that the pending bill is distinctly a measure calculated to greatly stimulate the shipbuilding industry and, in his opinion, the facilities of existing shipyards would be taxed for several years to meet all the new contract requirements, in addition to the coastwise and naval construction that, of course, would require to be taken care of while these vessels for the foreign trade were in process of building.

The friends of the pending bill are negotiating with the House leaders for recognition to call it up within the next week or 10 days. As it has already passed the Senate it will become a law if it goes through the House before the final adjournment on March 4, as the Senate will promptly concur in all the House amendments.

W. L. C.

For the year ending June 30, 1906, the New York Subway carried 137,919,632 passengers, while the aggregate carried by the elevated and surface lines was but 23,684,957 less than the aggregate carried by these lines in the year ending June 30, 1904, the last fiscal year before the Subway began operation. In other words, comparing the year 1906 with 1904, the aggregate paid fares on elevated, surface and Subway lines increased by 114,234,675, which is about three-fourths the ultimate capacity of the present Subway. It is evident that the existing systems will be greatly overcrowded before additional subways can be completed.

New Publications.

Boiler Waters: Scale, Corrosion, Foaming. By William Wallace Christie, Mem. A. S. M. E., Consulting Engineer. Pages, 235; illustrations, 77. Cloth. Price, $3. Publisher, D. Van Nostrand Company, New York.

Since it has become appreciated that most troubles with boilers are due to the water used, there has been more attention paid to means for providing pure soft water for boiler feeding. The author in his preface to this work states that the relative value of one boiler to another may, in many cases, be measured by its scale forming prospensity with a given water. Purify this water and all boilers come much nearer a uniform value per unit of heating surface. The softening of water for use in steam boilers is a practice which has grown remarkably in the last decade. Much credit is due to the Railway Master Mechanics' Association for the real progress which has been made in water softening for locomotives, and the same line of work is now receiving a greater amount of attention from manufacturers and industrial corporations. An intelligent understanding of the faults of the water supplies as usually found, and manners for correcting them is the essential to the greatest success in boiler operations. It is the aim of this book to furnish just such information. After explaining the causes of boiler scale, corrosion and foaming, it indicates how to remedy the evils by getting at the source. For instance, it is shown just which of the impurities in water are injurious or disadvantageous, and then how to get rid of them. The functions, advantages and use of feed water heaters and economizers in connection with boilers is treated in a chapter by itself, which points out the often underestimated importance of this class of apparatus. A special interest attaches to the book, as a whole, inasmuch as it is a pioneer on a subject which is of intimate moment to all users of steam boilers.

The Peabody Atlas: Coal Mines and Coal Railways. By A. Bement. Published by Peabody Coal Company, Chicago. Cloth, 18 x 21 in. Price, $5.

This volume contains much valuable information and interesting data relative to the bituminous mining industries of the Central West. It is embellished with numerous colored maps marking the coal areas of this section, upon which is shown the location of individual mining properties, together with their relative outputs. Diagrammatic scales are given, showing the increase of coal production in the United States since 1830 compared with the increase in population, and the average consumption of coal in tons per annum for each person in the United States for the same period. There are also interesting chapters containing chemical, geological and engineering data that are of undoubted value to mine operators, consumers and those interested in mechanical problems connected with power producing plants. A chapter devoted to smokeless furnaces and smoke suppression is liberally illustrated with photographs and sectional drawings of boilers and furnaces designed to show the latest approved methods of economical fuel consumption, and the devices best adapted to secure these results. Altogether, the work is one which should appeal to those interested in the subjects which it covers.

Concrete Factories, a Series of Papers on the Uses of Cement and Concrete in the Construction of Industrial Plants, compiled by Robert W. Lesley, Assoc. Mem. A. S. C. E. and editor of *Cement Age*. Illustrated; 152 pages. Cloth. Price, $1. Published by Bruce & Banning, New York.

This book offers in condensed form a complete review of the principles underlying reinforced concrete construction in a way to be easily understood by the layman, as well as the engineer. It contains the report of the Subcommittee on Tests, the report of the United States Advisory Board on Fuels and Structural Materials, the only translation of the French rules on reinforced concrete, which have just been issued by the Ministry of Public Works in France, and a number of profusely illustrated articles showing methods of reinforced concrete construction, including all the well-known reinforcing systems. A very concise description of the many concrete reinforcing systems now on the market is contained in a chapter by Walter Mueller on "Reinforced Concrete Construction," and one by E. A. Trege on "Concrete in Factory Construction" reviews the work that has been done with concrete in the construction of industrial plants during the first few years. The book also contains "A Surface Finish for Concrete," by Henry H. Quimby, A. S. C. E., and a symposium of articles on the use of concrete in constructional work by Emile G. Perrot, C. A. P. Turner, E. P. Goodrich, J. R. Worcester, Dean & Main, Leonard C. Mason, E. S. Larned, Chester J. Hogue, J. G. Ellendt and A. E. Lindau, and other authorities.

Self-Propelled Vehicles. A practical treatise on all forms of automobiles, by James E. Homans, A. M. Publishers, Theo. Audel & Co., 63 Fifth avenue, New York. Sixth revised edition entirely rewritten. Pages, 598; illustrations and diagrams, over 500. Price, $2.

The transition of the automobile from the experimental to the commercial stage and the radical changes which have taken place during its development have been so rapid that it has been necessary to continually revise this work. It is now in its sixth edition, although the first appeared in 1902. The purpose of the book is to acquaint the vehicle owner, operator and repairer with the construction and operation of automobiles by clear explanations of the principles governing design, so that he may master their intricacies, at least to the extent of knowing how to properly care for and repair them. In general theoretical matters important only to designers and builders are avoided where possible, and all but the practical has been eliminated. The gasoline vehicle being the typical automobile is given the most space. One particularly valuable chapter on "Gas Engine Management" covers virtually all the difficulties liable to occur under service conditions. All the accessory parts of an automobile—carburetters, igniters, transmission gears, &c.—are fully explained by typical examples. Substantially, it is a textbook on the subject and deserving of recognition in that respect.

New York–New Jersey Bridges Recommended.

The New York Interstate Bridge Commission has submitted a report to the Legislature of New York recommending the construction of three bridges between New York and New Jersey. One of these, it thinks, should be somewhere between Fourteenth and Seventy-second streets, New York, and the two others should span the Kills, which flow between Staten Island and New Jersey. These bridges should be considered strictly as public highways and as works of public improvement, and the expense should be borne either by the States of New York and New Jersey or by the State of New Jersey and the City of New York in just proportion. The Commission believes that this is the only practical way of accomplishing the bridging of the Hudson.

The report says that owing to the fact that the representatives of the State of New Jersey have not as yet signified to the New York Commission their agreement on any act to be passed by the Legislature of that State providing for the appointment of such a joint commission as is referred to in the organic authority of the Commission, the New York Commissioners are unable at present to recommend to the New York Legislature any appropriate legislation to be recommended by it, but promise to do so at the earliest possible moment.

Milliken Bros., Incorporated, 11 Broadway, New York, with works on Staten Island, started February 11 on rolling 20-in. wide plates made in grooved rolls, which they state are the widest grooved rolled plates ever made for structural purposes. The product proved entirely satisfactory, equal to universal mill plates. Arrangements have been made to roll such plates as wide as 24 in., but this width has not yet been undertaken.

PERSONAL.

W. A. Thomas has been elected president and C. G. Thomas secretary and treasurer of the Niles Iron & Sheet Company, Niles, Ohio.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, returned from Europe last week. A. W. Maconachie, a director of the English branch of the Chicago Pneumatic Tool Company, came over with Mr. Duntley.

At the annual meeting of the Niles-Bement-Pond Company, New York, held last week, James P. McKinney was elected a director to succeed William S. McKinney, and George T. Reiss was elected a director to succeed Gordon Shillito. The other directors were re-elected. Frederick Mueller, formerly head of the construction and drafting departments of the Singer Mfg. Company at Elizabethport, N. J., and an inventor of many machines used in the manufacture of sewing machines, has severed his connection with that company and has become consulting engineer of the Niles-Bement-Pond Company, being located at the Pratt & Whitney Works, Hartford, Conn.

At the annual meeting of the Pratt & Whitney Company, Hartford, Conn., F. G. Echols was elected a director, succeeding Francis Pratt. The other directors were re-elected.

J. M. Lambert, formerly superintendent of the plant of the Underwood Typewriter Company and recently connected with the Frevert Machinery Company, New York, has been made superintendent of the plant of the E. L. Watrous Mfg. Company, Des Moines, Iowa, manufacturer of stamped steel hardware. Mr. Lambert left New York this week to take up his new duties.

S. A. Carson, formerly with the H. C. Frick Coke Company, but more recently with McKeefrey & Co., Leetonia, Ohio, has resigned to take charge of the coke department of the Iron City Coal & Coke Company, Wabash Building, Pittsburgh.

M. Woolsey Campau, who for several years has been in the machinery business at Detroit, Mich., has accepted a position with the C. C. Wormer Machinery Company of that city and will represent the company principally in Michigan, making specialties of steam plant machinery and machine tools.

O. A. Stranahan, who recently resigned as sales manager for the Allis-Chalmers Company at Milawukee, has acquired an interest in the Electric Installation Company, Chicago. He has been elected a director of the company and will take an active part in its affairs.

W. G. Starkweather has resigned his connection with the Allis-Chalmers Company, Milwaukee, as assistant to the superintendent of construction in the steam engine department, to accept a position as mechanical engineer with the Hawley Down Draft Furnace Company, Chicago.

The American Steam Gauge & Valve Mfg. Company, 208-220 Camden street, Boston, Mass., announces that its Eastern representative, R. M. Turner, has been appointed manager of its publicity department. C. H. Mosher, who has had several years' selling experience in a similar line, has been appointed to succeed Mr. Turner as Eastern representative.

C. W. Owen has been appointed general sales agent of the Virginia Iron, Coal & Coke Company, with office at Bristol, Va.-Tenn., succeeding Guy Darst, resigned.

J. E. Galvin, Jr., manager of the Franklin, Pa., plant of the American Steel Foundries, has resigned to accept the position of vice-president of the newly organized Ohio Steel Foundry Company, which will erect a foundry at Lima, Ohio, for the manufacture of steel castings.

S. N. D. North, who has been in Berlin for some weeks as a member of the tariff commission appointed to confer with representatives of the German government, arrived in New York February 9.

Miss A. B. Chute, who has been assistant manager of the Enterprise Boiler Company, Youngstown, Ohio, has resigned and returned to her home in Cleveland. She is a mechanical engineer and a member of the American Boiler Manufacturers' Association. She was connected with the Enterprise Boiler Company for four years.

E. F. Daxman, formerly manager of the Derry Coal & Coke Company, Latrobe, Pa., has been appointed general manager of the coal and coke properties in western Pennsylvania and West Virginia belonging to the Central Iron & Steel Company, Harrisburg, Pa.

J. M. Van Harlinger, formerly manager of sales for the Atlanta, Ga., District for the Carnegie Steel Company, has resigned, and F. A. Dilworth, formerly salesman in the Pittsburgh District office, has been appointed to succeed him.

Labor Notes.

The Pennsylvania Engineering Works, New Castle, Pa., has made an agreement with its shop boiler makers which is the same as it was last year, except that on January 1 wages were increased 1 cent per hour. The agreement provides that nine hours shall constitute a day's work in the shop; overtime on contract work to be paid time and one-half and double time on holidays, but all repairs on the company's work to be paid single time. All the men who went out January 15 will be reinstated, as far as the work in the shop will permit, and no new men will be employed until all the old men have had an opportunity to return to work. The same company has also made an agreement with its boiler makers on outside construction, by which wages have been advanced from 39 cents to 45 cents per hour, and the working day fixed at eight hours. This agreement is for a year and is to become operative after the work now under construction is finished.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa., has signed an agreement with its molders for a nine-hour day with a minimum wage of $3.40 per day.

An interstate convention of the International Association of Machinists has been called, to meet in Pittsburgh March 11. Invitations have been extended to all locals within 200 miles of Pittsburgh. Among important questions to be discussed will be the contemplated demand of the machinists of the Pittsburgh District May 1. A minimum wage rate of 40 cents an hour, a 50-hr. week, an increase of 10 per cent. for all machinists receiving over 40 cents per hour and 10 per cent. increase for all specialists may be asked.

Skilled mechanics at the Shenango and Greer works of the American Sheet & Tin Plate Company at New Castle, Pa., have demanded an increase in wages. The men making the demand include plumbers, pipe fitters and pot makers. Laborers employed at these works recently received an advance of 10 cents a day.

The Phœnix Horse Shoe Company, according to an announcement just made, has passed by purchase under the control of a syndicate composed of J. W. Kiser, J. R. Gorgan, W. T. Kelley and Darius Miller of Chicago, and Judge E. H. Gary, chairman of the United States Steel Corporation. Mr. Kiser will be elected president of the company shortly and Mr. Kelley will become a member of the Board of Directors. The company has two plants, each comprising rolling mills and horseshoe factories. One plant is located at Poughkeepsie, N. Y., and the other at Joliet, Ill. The Poughkeepsie plant was built in 1873 and the Joliet plant in 1893.

Gilbert J. Rugg, one of the founders of the firm of Witherby, Rugg & Richardson, manufacturers of woodworking machinery, Worcester, Mass., died in that city February 7, aged 70 years. He was actively engaged in manufacturing for 50 years, retiring three years ago, when the business was purchased by the Hobbs Mfg. Company.

Pig Iron Production Decreasing.

The Loss Confined to Steel Works, Merchant Furnaces Gaining Slightly.

The pig iron statistics for January give little promise of production overtaking consumption in the near future. The coke and anthracite furnaces produced less iron than in December, or 2,205, 007 gross tons as against 2,235,306. Notwithstanding that three new furnaces of modern capacity were blown in Josephine in Pennsylvania, Toledo No. 2 in Ohio, and Federal in Illinois, and that the total of furnaces blown in was nine, the losses were greater than the gains, 11 furnaces being blown out last month. Furthermore, inability to get sufficient coke interfered with production in several districts, so that the active capacity on February 1, which is rated largely according to performance in the preceding month, was 492,359 tons a week for 317 furnaces, as against 507,332 tons a week for 319 furnaces active on January 1. It is noteworthy that the steel works furnaces fell off about 39,000 tons from the December record. As the total falling off is about 30,000 tons, it would appear that the merchant furnaces made a slight gain upon their December output. The following table gives the production of the coke and anthracite furnaces in January, as compared with the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	September. (30 days)	October. (31 days)	November. (30 days)	December. (31 days)	January. (31 days)
New York....	140,105	139,868	134,902	134,393	136,057
New Jersey..	34,849	32,297	34,697	33,057	34,323
Lehigh Valley	50,946	51,224	49,636	52,868	58,930
Schuylkill Val.	48,245	50,375	57,649	62,741	62,118
Lower Susquehanna and Lebanon Val.	63,968	65,231	62,016	61,481	58,101
Pittsburgh Dis.	460,903	567,662	509,211	525,312	505,514
Shenango Val.	138,843	150,019	155,698	172,604	171,830
West. Penn..	98,237	116,588	116,732	124,007	122,641
Md., Va. and Kentucky ..	78,654	89,280	86,841	85,520	87,919
Wheeling Dis.	102,364	112,022	126,796	128,294	102,158
Mahoning Val.	149,635	186,983	187,261	187,577	196,426
Central and North. Ohio.	152,730	149,339	173,444	162,930	172,031
Hocking Valley and Hanging Rock	31,383	33,753	35,690	35,509	31,911
Ill.,Mich.,Minn., Wis., Mo. and Colo.	244,403	264,966	265,893	290,281	283,934
Alabama	132,554	143,254	150,506	139,432	145,233
Tennessee, No. Caro., Texas and Georgia.	43,143	43,947	40,093	39,309	36,481
Totals	1,970,962	2,196,808	2,187,665	2,235,306	2,205,607

To the above amount about 36,000 tons is to be added for the output of charcoal iron, that being about the rate of its production in 1906.

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of products month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1905.	1906.	1907.	1906.	1907.
January	1,129,042	1,358,015	1,406,397	26,305	21,477
February	1,027,937	1,226,760	.....	26,988	....
March	1,232,255	1,400,395	.....	23,595	....
April	1,222,710	1,333,591	.....	28,054	....
May	1,287,438	1,372,423	.....	29,447	....
June	1,149,404	1,293,437	.....	22,737	....
July	1,114,409	1,323,391	.....	20,153	....
August	1,186,050	1,237,485	.....	18,327	....
September ...	1,262,033	1,264,380	.....	24,078	....
October	1,370,960	1,452,200	.....	23,517	....
November	1,334,644	1,411,350	.....	29,119	....
December	1,356,962	1,445,528	.....	21,707	....

Among furnaces blown in in January were Tidewater, in the Schuylkill Valley, one Palmerton in the Lehigh Valley, one Duquesne in Allegheny County, Josephine in western Pennsylvania, one Paxton in the Lower Susquehanna Valley, Alleghany in Virginia, one Central and Toledo No. 2 in northern Ohio and the new Federal in Illinois (February 1).

Among furnaces blown out last month were two Eliza western Pennsylvania, one Paxton in the Lower Susquehanna Valley, one Ashland in Kentucky, one Steubenville in the Wheeling District, one Columbus in Ohio, one Bay View in Wisconsin, Anna in the Mahoning Valley, one Sloss-Sheffield and one Bessemer in Alabama and one Dayton in Tennessee.

The table below gives the active capacity per week on February 1 and January 1, of furnaces producing coke and anthracite iron:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	—February 1.— Number in blast.	Capacity per week.	—January 1.— Number in blast.	Capacity per week.
New York:					
Buffalo 13	13	13	25,186	13	24,647
Other New York...10	5	5	5,537	5	5,644
New Jersey..... 8	8	8	7,574	8	7,304
Spiegel 2	2	2	178	1	164
Pennsylvania:					
Lehigh Valley.....23	18	18	12,453	18	11,767
Spiegel 3	2	2	854	2	469
Schuylkill Valley...13	13	13	14,021	13	14,483
Spiegel 1	1	0	560	0	0
Low. Susquehanna .8	5	5	5,473	5	5,684
Spiegel 1	1	1	641	1	693
Lebanon Valley.... 9	9	6,789	10	7,511	
Spiegel 1	1	520	0	0	
Pittsburgh District.43	40	106,822	41	117,903	
Spiegel 2	2	1,155	2	1,799	
Shenango Valley...20	19	38,801	19	39,551	
West Penn.....25	21	28,834	20	28,007	
Maryland 3	3	7,504	4	8,232	
Spiegel 1	1	535	0	0	
Wheeling District....14	11	22,568	12	26,369	
Ohio:					
Mahoning Valley...18	17	42,784	18	45,164	
Central and Northern and Michigan.21	20	40,439	19	39,918	
Hocking Valley and Hanging Rock...12	12	7,509	12	8,193	
Illinois 23	22	48,123	21	45,406	
Spiegel 1	1	861	1	889	
Minnesota 1	1	1,248	1	1,253	
Wisconsin 5	4	4,119	5	5,232	
Missouri 1	1	525	1	861	
Colorado 5	5	8,726	4	7,238	
Spiegel 0	0	0	1	628	
The South:					
Virginia 23	14	9,526	13	8,923	
Kentucky 7	3	2,257	4	2,597	
Alabama 46	28	31,997	30	31,519	
Tennessee 18	12	7,336	13	8,344	
Georgia and Texas. 3	2	904	2	940	
Totals.....384	317	492,359	319	507,332	

The active capacity in coke and anthracite iron fluctuated as follows in the past five years:

	Capacity Per week.		Capacity Per week.
February 1.....	492,359	July 1.....	272,301
January 1, 1907.....	507,397	June 1.....	336,107
December 1, 1906....	513,860	May 1.....	368,244
November 1.....	500,580	April 1.....	337,257
October 1.....	469,665	March 1.....	308,751
September 1.....	441,426	February 1.....	273,692
August 1.....	449,908	January 1, 1904.....	185,636
July 1.....	460,570	December 1, 1903....	244,156
June 1.....	472,622	November 1.....	273,715
May 1.....	484,031	October 1.....	353,142
April 1.....	484,240	September 1.....	360,197
March 1.....	479,737	August 1.....	353,681
February 1.....	482,156	July 1.....	384,825
January 1, 1906.....	463,673	June 1.....	388,178
December 1, 1905....	475,814	May 1.....	373,496
November 1.....	460,449	April 1.....	386,215
October 1.....	445,468	March 1.....	347,424
September 1.....	412,563	February 1.....	335,239
August 1.....	410,088	January 1, 1903.....	346,073
July 1.....	408,617	December 1, 1902.....	336,617
June 1.....	443,092	November 1.....	330,110
May 1.....	452,031	October 1.....	337,837
April 1.....	439,564	September 1.....	328,243
March 1.....	403,157	August 1.....	328,745
February 1.....	405,792	July 1.....	303,793
January 1, 1905.....	377,879	June 1.....	337,492
December 1, 1904....	357,846	May 1.....	337,627
November 1.....	334,249	April 1.....	331,140
October 1.....	319,249	March 1.....	316,039
September 1.....	291,573	February 1.....	325,440
August 1.....	246,092	January 1, 1902.....	291,992

NEWS OF THE WORKS.

Iron and Steel.

Bay View Furnace No. 1 of the Illinois Steel Company, at Milwaukee, Wis., was blown out January 28.

Of the increase of $250,000 recently made in the capital stock of the United Steel Company, Canton, Ohio, about $150,000 was spent last year on improvements and the balance will be held in the treasury for such purposes as the directors may authorize in the future. The company does not contemplate improvements this year, except of a minor nature.

W. A. Thomas has been elected president of the Niles Iron & Sheet Company, Niles, Ohio, and C. G. Thomas secretary and treasurer. The company reports a most prosperous year, and far ahead of the previous year.

The Lebanon Valley Iron Company, Lebanon, Pa., has elected these directors: Eli Attwood, H. H. Light, Simon P. Light, W. S. Davis, S. L. Light, J. Warren Light, Lebanon, Pa., and W. W. Light and George D. Horst, Reading. H. H. Light was re-elected president.

Henry Disston & Sons, Philadelphia, Pa., operating the Keystone Saw, Tool, Steel & File Works, has filed plans for a new building, 50 x 150 ft., of steel construction, which is to be used for a 9-in. bar mill.

The Shelby Iron Company's charcoal furnace at Shelby, Ala., will be blown in this week. There is a marked demand for charcoal iron. Several coke furnaces in the same district that have been undergoing repairs are ready to be blown in.

General Machinery.

At a recent meeting of the directors of the Union Machine Company, Zanesville, Ohio, John C. Saner retired from the directorate and presidency and E. R. Meyer was elected president in his place.

The B. F. Sturtevant Company, Boston, Mass., has recently received orders for its new type of high pressure rotary blowers from the General Fire Extinguisher Company, Atlanta, Ga.; Rivett Lathe Company, Brighton, Mass.; Wayne Agricultural Works, Goldsboro, N. C.; J. B. Clark Mfg. Company, Rockford, Ill.; New York Continental Jewel Filtration Company, New York; Winchester Repeating Arms Company, New Haven, Conn.; Salem Glass Company, Salem, N. J.; Eastern Chemical Company, Boston, Mass. Mechanical draft apparatus: Jacob Ruppert Brewery, New York; Wellman-Seaver-Morgan Company, Cleveland, Ohio; Leominster Button Company, Leominster, Mass.; Saquoit Silk Mfg. Company, Philadelphia, Pa.; John L. Roper Lumber Company, Oriental, N. C.; Barber Asphalt Paving Company, Nyack, N. Y.; Fels & Co., Philadelphia, Pa.; Worcester Gas Light Company, Worcester, Mass.; Crane Company, New York; Michigan Copper Mining Company, Keweenaw Bay, Mich. Among large plants now being equipped with the Sturtevant system of heating and ventilating are Reeves & Co., Columbus, Ind.; National Tube Company, McKeesport, Pa.; Graton & Knight Mfg. Company, Worcester, Mass.; Canadian Pacific Railway Company, Toronto Junction, Ont.; the coal washer of the Jefferson & Clearfield Coal & Iron Company, Ernest, Indiana County, Pa.

The American Machine Mfg. Company, Detroit, Mich., has increased its capital stock from $60,000 to $100,000.

The Amsler Engineering Company, Pittsburgh, has recently completed contracts as follows: Open hearth furnace for Mackintosh-Hemphill & Co., Pittsburgh, continuous heating furnace at Franklin, Pa., 13 air reversing valves for various steel and glass plants, several glass furnaces, eight gas producers in Indiana, Kentucky, Ohio and Pennsylvania. The company has booked four large concrete buildings, two large producer gas power plants, several hot blast stoves and other smaller contracts. Two branch offices have been recently opened, one in the Fisher Building, Chicago, Ill., in charge of E. G. Fisher, and one in the Grand Opera House Building, Cincinnati, Ohio, in charge of M. W. Anderson. Its business has increased so rapidly in these sections that these branch offices were opened to give better service to its patrons in the territory adjacent to these cities.

The Illinois Bolt, Nut & Forging Works, Chicago, recently incorporated, has let the contract for the building of a new plant, which will be located at Thirty-fifth street and Ashland avenue, which it is expected will be ready for operation by April 1. The plant will be operated by electricity, and the greater part of the machinery equipment has already been purchased. At a recent meeting of the stockholders the following officers were elected: P. H. Joyce, president; Lloyd J. Smith, vice-president; M. L. Hunt, secretary and treasurer.

The ownership and management of the Union Iron Works, Bangor, Maine, machinist, founder and builder of mill machinery, has been changed by the purchase of a controlling interest in the stock by Harold Hinckley, formerly of Bangor and more recently of Milwaukee, Wis. A radical change in the officers has resulted. Fred W. Ayer is the new president; Harold Hinckley, treasurer; Charles A. Watters, general manager; and these officers with Fred R. Ayer, Stanley P. Dennett, Nathaniel Lord and Walter L. Morse constitute the Board of Directors. Mr. Watters was the general manager under the old management.

Fay & Scott, Dexter, Maine, manufacturers of machine tools, will rebuild that part of their plant recently damaged by fire, but not until spring, temporary repairs sufficing until that time. The new building will be of reinforced concrete. It will need no new equipment. The newspaper reports of the fire were greatly exaggerated. The loss was about $4000, fully covered by insurance, and was confined to the casting cleaning and polishing department. There was no shutdown excepting for a few days in this one department.

The George J. Meyer Company, Milwaukee, Wis., manufacturer of brewery machinery, has purchased the plant and goodwill of the Davis Brothers Mfg. Company at 576-584 Clinton street for $35,000. The plant has a frontage of 110 ft. on Clinton street and 150 ft. on Barclay street, and the purchase includes all machinery and fixtures. The Meyer company has heretofore occupied leased quarters at Lake and Clinton streets. Plans for an addition to the Davis Plant, to cost $25,000, are already under way and when completed the company will employ upward of 150 men.

The Berlin Construction Company, Berlin, Conn., has received a contract for building an extension to the fan shop of the Green Fuel Economizer Company, at Matteawan, N. Y., which will enable it to more than double its present output. A shop has also been put up exclusively for manufacturing the new patent Green steam and hot water heating coil. The pressure of business in these lines and also in the manufacture of fuel economizers has compelled the Green Fuel Economizer Company to acquire for building purposes several acres of land adjacent to the present property.

The Alliance Machine Company, Alliance, Ohio, manufacturer of rolling mill machinery, has increased its capital to $500,000, and contemplate making some large extensions to its plant. This company has recently re-elected officers as follows: W. H. Purcell, president and general manager; W. J. Finnerty, vice-president; M. S. Milbourn, treasurer; G. W. Shem, secretary and engineer. Directors were also elected consisting of J. C. Cromwell, J. E. Schwab, W. J. Fennerty, G. W. Shem, W. H. Purcell and M. S. Milbourn.

Power Plant Equipment.

The Washington Water Company, Spokane, Wash., will erect a steam power plant to cost about $800,000. The engineers in charge of this work are W. S. Barstow & Co., 56 Pine street, New York.

The Newcomerstown Electric Light, Heat & Power Company, Newcomerstown, Ohio, has been incorporated, with a capital stock of $25,000, and is erecting a new plant on the premises of the Novelty Brick & Coal Company, with which the new organization is closely connected.

The Denison Light & Power Company, Denison, Texas, is planning improvements to its gas and electric plant that will cost in the aggregate $50,000. It is proposed to sell three 133-cycle dynamos, now in use, belted to reciprocal engines and having a total capacity of 520 kw., and to replace these units with three direct connected 60-cycle machines, with a total capacity of 750 kw. It is also proposed to add one bench of retorts to the present gas plant capacity. Though the plans outlined may in a measure be modified, the general line of improvements contemplated will be carried out.

J. R. Gemmill, proprietor of the Sharpsville Boiler Works, Sharpsville, Pa., has disposed of the plant and good will to P. C. Reed, W. E. Shipley, F. W. King and W. C. Rumbaugh. The new owners took possession on February 1, and will incorporate with a capital stock of $15,000. P. C. Reed will be president; W. E. Shipley, vice-president and general manager; F. W. King, secretary and treasurer.

The Prescott Mfg. Company, Germantown, Philadelphia, will take over the plant of the Prescott Turbine Engine Company and will spend several thousand dollars in purchasing new machinery to equip the plant for the manufacture of turbine engines. Rowland Croskey is president; James C. Prescott, vice-president; H. C. Potts, secretary, and William R. Taylor, treasurer. Henry A. Prescott is general manager.

Through its Mexican agents, G. & O. Braniff & Co., the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., has received an order from the Compania Electrica e Irrigadora, Pachuca, Mexico, for four 1540-kw. generators, two 125-kw. exciter generators and other apparatus for the new Elba generating station which will be used for generating additional power for Pachuca.

Foundries.

The Keeley Stove Company, Columbia, Pa., is enlarging its plant and making changes to enable it to more conveniently handle its work.

Phillips & McLaren, operating foundry and machine shops in Pittsburgh, have been dissolved and have been succeeded by a corporation known as the Phillips & McLaren Company, which will carry on the business. John McLaren is president and William J. Phillips is secretary and treasurer of the new corporation.

The Kankakee Mfg. Company, Kankakee, Ill., manufacturer of furniture and other specialties, has just added a modernly equipped foundry to its plant. This department was added primarily to manufacture the M. A. Cook improved magazine feed hot water and steam boiler, but will also do general jobbing foundry work.

Beckwith Bros. & Co., Westfield, Mass., manufacturers of piano legs, lyres, &c., have purchased the building known as the Massasoit Whip Company factory and will equip it with the most modern woodworking machinery.

The Fort Pitt Malleable Iron Company, McKees Rocks, Pittsburgh, has completed an extension to its foundry, 100 ft. in length, and has a new 15-ton furnace under way. The company has decided to enlarge its finishing end to care for this new furnace by an addition of three annealing furnaces, and a further addition of 180 ft. will be made to the foundry in the near future.

The Union Mfg. Company, New Britain, Conn., manufacturer of planes and chucks, is contemplating erecting an addition to its foundry, 90 x 120 ft., which will connect with the present foundry by a building 40 x 100 ft. and three stories. The addition is entirely for increase in foundry facilities, and equipment and tools have already been arranged for.

The Kennedy Valve Mfg. Company, Elmira, N. Y., has let a contract for the construction of its new brass foundry, 45 x 300 ft., and power house, 48 x 75 ft. The buildings will be of structural steel and brick. The company has purchased a large part of the power house equipment, consisting of two 250-hp. Babcock & Wilcox boilers, a 200-kw. generator and 10 motors of from 15 to 60 hp. of Western Electric make, and 300-hp. high speed Harrisburg engine, direct connected to generator. The three buildings which were contracted for in the summer, including an iron foundry and machine shop, 95 x 300 ft. each, and pattern shop and pattern storage building, 50 x 300 ft., are completed and ready for the installation of the equipment, which will be made in as short time as possible. The plant will be equipped with an up to date heating system, to be installed by the General Fire Extinguisher Company, Providence, R. I.

The National Radiator Company, manufacturer of hot water and steam radiators, Lebanon, Ind., has recently been incorporated, with a capital stock of $30,000. It is the purpose of the new company to begin at once the building of a plant, which will consist of a foundry, 60 x 70 ft.; machine shop, 30 x 60 ft., and other necessary auxiliary buildings. It is expected that the plant will be ready for operation some time in April. The officers elected are Geo. W. Norwood, president; T. Holland, vice-president; W. J. De Vol, treasurer; W. S. Ritchie, secretary and general manager.

The Ohio Steel Foundry Company has been organized under the laws of the State of Ohio with a paid in capital of $400,000, and will erect a modern steel foundry at Lima, Ohio, for the manufacture of steel castings, with an initial capacity of 1000 tons per month. The officials are: Harry Wright, formerly district superintendent of the American Steel Foundries at Sharon, Pa., president; J. E. Galvin, Jr., of Franklin, Pa., vice-president, and John W. Kaufman of Columbus, Ohio, secretary and treasurer.

Bridges and Buildings.

The Dubuque & Wisconsin Bridge Company has let the contract for a new 324-ft. steel span in the bridge spanning the Mississippi River at Dubuque, Iowa, to Bayne & Co., Minneapolis, Minn. The work is now in progress.

The Southwestern Bridge Company, successor to the Bartlett Steel Company, manufacturer and contractor of metallic structures, Joplin, Mo., has completed the erection of a new plant for the manufacture and erection of steel structural work, including bridges, buildings and other structures of like character. Equipment has already been purchased and the plant is now about ready for operation.

The Pennsylvania Railroad has authorized additions to its Jersey City terminal station which will cost approximately $300,000. These improvements will include the erection of a new building, 120 x 620 ft.

The Columbus Structural Steel Company, Columbus, Ohio, is adding considerable new equipment to its plant, including riveting machines, a large new saw capable of operating on 24-in. I-beams and other large machines. The company is running its plant to full capacity and has recently turned down a large number of contracts on which it could not make required delivery. The annual meeting of the company will be held on March 6, at which time the question of further extensions to the plant will come up for action.

Motors and Small Engines.

The Hubbard Motor Company, Middletown, Conn., manufacturer of marine and stationary gasoline motors, which had planned to erect a new shop in that place, has abandoned the idea because it was found impossible to wait for the completion of such a building. Consequently, a factory in Middletown, known as the Doebler plant, has been purchased, and the company is now moving to its new home. The building is equipped with power plant, shafting and machinery. The company may build an addition, but this is not definitely decided. The company states that its requirements in the way of new machinery are not large at the present time.

Fires.

The plant of the Enterprise Stamping Company, McKees Rocks, Pa., was damaged $25,000 by fire February 1.

The roundhouse and machine shops of the Missouri & Louisiana Railroad at Bevier, Mo., were destroyed by fire February 7. The loss is placed at $150,000.

The boiler shop of J. J. Finnegan & Co., Atlanta, Ga., was burned February 4.

No. 5 Breaker of the Delaware & Hudson Company, at Parsons, near Wilkes-Barre, Pa., was destroyed by fire February 7. The loss is estimated at $75,000.

On February 7 a fire did $75,000 damage to the repair shop of the Montpelier & Wells River Railroad at Montpelier, Vt.

The factory of the Boston & Lockport Block Company, Boston, Mass., was burned last week, the loss being about $50,000.

The building and patterns of the Smedley Pump Works, Dubuque, Iowa, were damaged $10,000 by fire February 6.

The pumping station of the Grand Rapids Hydraulic Company, Grand Rapids, Mich., was burned February 6, the loss being about $25,000.

Hardware.

The Duluth Corrugating & Roofing Company, Duluth, Minn., has increased its capital stock from $5000 to $10,000, for the purpose of equipping a new plant with modern machinery of greater capacity for the manufacture of corrugated iron steel ceilings, conductor pipe and a general line of sheet metal work. The recently elected officers are Herman Heinrichs, president and treasurer; M. J. McMartin, vice-president and general manager; T. J. Davis, secretary.

The Bakery Display & Shipping Can Company has been incorporated at Buffalo, N. Y., with a capital of $50,000, to manufacture a combined display and shipping can for bakers' goods, the patents for which it controls. The company will erect a two-story factory, 60 x 100 ft., of concrete and steel construction, equipping same with stamping machinery of special design, which will be operated by Niagara Falls power.

The Hall Novelty Mfg. Company, maker of wire novelties and toys, Minneapolis, Minn., contemplates moving its plant to Rock Island, Ill.

The Union Razor Company, Tidioute, Pa., intends erecting a new building in the spring which will about double the present manufacturing capacity. Business during 1906 was 50 per cent. in excess of that of any previous year.

The plant of the G. M. Yost Mfg. Company, recently formed for the manufacture of a full line of machinists' vises, with location at Mechanicsburg, Pa., is now in operation. The company has leased a building, 68 x 156 ft., which has been equipped with special machines and tools. The company also expects to start a foundry in the near future.

The stockholders of the Wheeler & Wilson Mfg. Company, Bridgeport, Conn., manufacturer of sewing machines, met January 24 and formally voted to end the corporate existence of the company by ratifying the sale of the business to the Singer Mfg. Company. The Wheeler & Wilson plant will hereafter be known as Factory No. 10 of the Singer Mfg. Company. These directors were elected at the meeting: Douglas Alexander, Stamford, Conn.; E. H. Bennett, Bayonne, N. J.; George M. Eames, Bridgeport, Conn.; O. R. Graham, Elizabeth, N. J., and T. E. Hardenbergh, J. J. Sullivan and C. H. Liebert of New York City. This board will wind up the affairs of the Wheeler & Wilson Company, settling all debts and collecting the outstanding obligations.

Miscellaneous.

The Fore River Shipbuilding Company, Quincy, Mass., has been awarded the contract for the fifth steel freight steamer for the Atlantic & Birmingham Construction Company, to be delivered within 11 months. This freighter is one of five, two of which have already been delivered by the Fore River Shipbuilding Company, which will run between New York and Brunswick, Ga.

The Long Arm System Company, Cleveland, Ohio, whose principal business has been the manufacture of power doors for battleships, has now gone extensively into the manufacture of automobile parts. Owing to the addition the company has installed a large quantity of new machinery during the past year.

The report that the plant of the Belle City Mfg. Company, Racine, Wis., was recently destroyed by fire is erroneous. There was no fire at the plant.

The Delphos Mfg. Company, Delphos, Ohio, which recently succeeded to the business of the Delphos Can Company, is successfully operating its new galvanizing plant of 50 tons capacity a day, and is turning out a fine grade of sheets. The company is also making eaves trough, conductor pipe, ridge roll, valley, miters, &c.

The Electric Fittings Company, recently incorporated, will occupy the plant formerly used by the Morse Chain Company, Truemansburg, N. Y., where it will manufacture electric fittings, including switches, electric bells, floor buzzers, annunciators, new time clocks, &c., and a new electric bell in all sizes. The plant will be managed by Mr. Raymond of the Proctor-Raymond Company, formerly of Buffalo. W. P. Biggs of the Biggs Company, Truemansburg, is president; Arthur F. Stanley, vice-president; R. J. Hunt, secretary, and E. P. Bouton, treasurer.

The Iron and Metal Trades

The blast furnaces have not been working well lately and the output has not been as large as it should be. During January the production of Coke and Anthracite Pig Iron amounted to 2,205,407 gross tons, as compared with 2,235,306 tons in December, the production of the Steel Works stacks having been 1,406,397 and 1,445,528 tons, respectively. The decrease in output was therefore due entirely to the latter. The Merchant furnaces held their own. It is interesting to note that three new stacks were added to their number during January, the Josephine, Federal and second Toledo having made their first Iron in that month. We entered February with an active furnace capacity of 492,359 tons per week, as compared with 507,322 tons per week on January 1.

Prices for spot Iron are lower in the South, and $21 for No. 2 Foundry, Birmingham, has been done. The Pig Iron markets are quiet throughout the country, with little pressure to sell and very little anxiety to buy.

The announcement has just been made that the contract for 38,000 tons of Water Pipe for New Orleans has been let on the basis of $33 per net ton for the 1907 and $32 for the 1908 delivery. This shows that the fears were not justified, that present high prices for material might cause the closing of contracts for next year's part of the work to be postponed.

In the Steel Rail trade an interesting event has been the sale, for export, of a lot of 50,000 tons of 80-lb. Rails, for delivery during the second half of this year. It is worthy of special mention that the price realized for these Rails nets the mill more than is being obtained for domestic business. There has also been sold for shipment to Bolivia one lot of 6000 tons. For the same railroad there has been just placed more than 200 small Bridges, the total tonnage being estimated at between 1800 and 2000 tons.

From the Plate, Bar, Sheet, Tin Plate, Tube and Wire mills comes the story of a rush of specifications on old orders and of new orders. Among the larger contracts recently closed with Tube mills is one for 400 miles of Pipe for the Southern Pacific, for a new oil line in California.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 13, 1907.	Feb. 6, 1907.	Jan. 9, 1907.	Feb. 14, 1906.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	**$26.00**	$26.50	$25.50	$18.50
Foundry No. 2, Southern, Cincinnati	26.00	26.00	26.00	16.75
Foundry No. 2, Local, Chicago	25.50	25.50	25.50	19.00
Bessemer, Pittsburgh	*22.85*	22.85	23.35	18.35
Gray Forge, Pittsburgh	*22.25*	22.35	23.35	18.35
Lake Superior Charcoal, Chicago	27.00	27.00	27.00	20.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	29.50	29.50	29.50	27.00
Forging Billets, Pittsburgh	*36.00*	36.00	36.50	32.00
Open Hearth Billets, Phila	33.00	33.00	33.00	29.00
Wire Rods, Pittsburgh	37.00	37.00	37.00	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	18.00	18.00	18.00	15.00
Steel Rails, Melting, Phila	18.75	18.75	18.75	17.25
Iron Rails, Chicago	*25.00*	27.00	28.00	21.50
Iron Rails, Philadelphia	27.50	27.50	27.50	23.00
Car Wheels, Chicago	*23.50*	24.50	25.00	19.00
Car Wheels, Philadelphia	23.00	22.50	23.00	18.75
Heavy Steel Scrap, Pittsburgh	*18.00*	18.25	19.00	16.00
Heavy Steel Scrap, Chicago	*16.00*	16.00	17.00	13.50
Heavy Steel Scrap, Philadelphia	18.50	18.50	18.50	16.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	**1.93½**	1.93½	1.88½	1.73½
Common Iron Bars, Chicago	1.81½	1.81½	1.81½	1.75
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.85
Steel Bars, Tidewater, New York	1.74½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel,, Pittsburgh	**1.85**	1.80	1.65	1.57½
Skelp, Sheared Steel, Pittsburgh	**1.95**	1.90	1.70	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.30
Wire Nails, Pittsburgh	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh	2.05	2.05	2.05	1.80
Barb Wire, Galv., Pittsburgh	2.45	2.45	2.45	2.30
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**25.12½**	25.00	24.25	17.87½
Spelter, New York	**7.00**	7.00	6.80	6.10
Spelter, St. Louis	**7.80**	6.75	6.60	5.95
Lead, New York	6.30	6.30	6.30	5.40
Lead, St. Louis	6.10	6.10	6.10	5.35
Tin, New York	**42.40**	42.50	41.55	36.60
Antimony, Hallett, New York	25.00	25.00	25.00	16.00
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, 100 lb., New York	$4.09	$4.09	$4.09	$3.69

Chicago.

FISHER BUILDING, February 13, 1907.—(*By Telegraph.*)

As a result of the absence of a decisive movement in either buying or price changes, no new features of importance have been introduced into the Pig Iron market during the week. Interest so far as this market is concerned centers in Southern Irons, the holders of which are seemingly not so perfectly in accord as are the Northern Iron interests. What differences appear in the matter of quotations largely concern last half holdings, but up to the present time the degree of variance in quotations has been unimportant. Each individual interest seems to be guided in its offerings by the amount of unsold tonnage it may yet have for disposal. Although large consumers still hold aloof, and manifest but little disposition to enter the market on prices now ruling, there is, on the other hand, a plentiful supply of smaller orders ranging from 200 to 500 tons mostly for second and third quarter delivery. The ruling price continues to be $18.50, Birmingham, and though rumors of offerings shading this figure have been heard it is believed that no such sales have been made in this market. Prices on Northern Irons are firm, and there is no disposition on the part of sellers to make concessions for any delivery throughout the year. In Finished Iron and Steel the most notable feature is the unprecedented demand for Plates, which shows no sign of abatement, and which has filled mill order books for months to come. The pressure for Structural Material, on the other hand, has a noticeably great decrease, and mills are taking the opportunity thus offered to increase their Billet making capacity.

Pig Iron.—Any anticipation of a marked recession of prices that may have been inspired by the slightly easier tone

in Southern Irons last week has apparently thus far failed of realization. There is, it is true, a disposition on the part of some furnace interests to be less exacting as to the differences in prices heretofore maintained between delivery divisions, but $18.50 for No. 2 Foundry, Birmingham, for the last half, is still strongly held. Sellers affirm that this price represents the minimum in this market, at least for the period named, and if any shading is possible it is of slight extent. While the total volume of spot sales is somewhat lessened, there is nevertheless an amount of business of this sort moving that in the aggregate represents a fair tonnage, and recent sales at $23 Chicago, in lots from 200 to 500 tons are reported. The run of early delivery orders now in the market suggests buying of a filling-in character for the purpose of reinforcing first half stocks. A sale of 1000 tons of Gray Forge at $18, Birmingham, for last half is noted. The attitude of Northern furnaces, whose unsold tonnage is comparatively small, is uncompromisingly strong, assuming as they do that the orders which will come to them in the regular course of business will exhaust their unsold output for 1907. They are accordingly holding firm at current quotations. Much complaint is heard on account of the inadequacy of shipping facilities, which is still seriously interfering with the movement of Iron from Southern yards. No buying on a large scale for deliveries through the second half has developed, and the general movement in future business is easier. Quotations for February and March shipments, f.o.b. Chicago, including the 45c. advance in freight rate on Southern Irons, effective March 3, are as follows:

Lake Superior Charcoal	$27.00 to $27.50
Northern Coke Foundry, No. 1	26.00 to 26.50
Northern Coke Foundry, No. 2	25.50 to 26.00
Northern Coke Foundry, No. 3	25.00 to 25.50
Northern Scotch, No. 1	26.00 to 27.00
Ohio Strong Softeners, No. 1	26.00 to 26.50
Ohio Strong Softeners, No. 2	25.50 to 26.00
Southern Coke, No. 1	27.35 to 27.85
Southern Coke, No. 2	26.85 to 27.35
Southern Coke, No. 3	26.35 to 26.85
Southern Coke, No. 4	25.85 to 26.35
Southern Coke, No. 1 Soft	27.35 to 27.85
Southern Coke, No. 2 Soft	26.85 to 27.35
Southern Gray Forge	22.35 to 22.85
Southern Mottled	22.35 to 22.85
Malleable Bessemer	26.00 to 26.50
Standard Bessemer	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	30.30 to 30.80
Jackson Co. and Kentucky Silvery, 8 %	32.30 to 32.80
Jackson Co. and Kentucky Silvery, 10 %	34.30 to 34.80

Metals.—The demand holds steady, but purchases are confined to the immediate needs of the buyer. Movements characterizing the entire list are without significant feature. There are said to be no open stocks of Casting or Lake Copper, though the local supply is adequate to the current demand: We quote as follows: Casting Copper, 26½c. to 27c.; Lake, 27c. to 27½c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 45⅝c.; small lots, 46c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Corroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Spelter, 6.90c.; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is $8.40 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 21½c.; Heavy Copper, 20¼c.; Copper Bottoms, 19½c.; Copper Clips, 20c.; Red Brass, 19½c.; Red Brass Borings, 16¼c.; Yellow Brass, 16c.; Yellow Brass Borings, 14¼c.; Light Brass, 13c.; Lead Pipe, 5.50c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 28c.; Tin Foil, 34c.; Block Tin Pipe, 27½c.

(*By Mail.*)

Billets and Rods.—Transactions in Rods are usually in small lots, and prices are unchanged. None of the larger interests have any considerable surplus to sell, and for small lots former quotations of $36 to $37 are still ruling. The movement of Forging Billets is of an ordinary character, and they are quoted at $38, with the usual advance according to size.

Rails and Track Supplies.—Indications point to a somewhat lessened demand for Light Rails, though Western mills are well booked up on orders, and not in position to take business for prompt delivery. Prices have not been affected in this market, though slight shadings are reported elsewhere. A fair number of orders and inquiries are being received for Track Supplies, though no transactions of importance are noted. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.40c. to 2.50c., according to delivery; Track Bolts, 2.75c. to 2.85c., base, Square Nuts, and 2.90c. to 3c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, $33; 25-lb., $34; 20-lb., $35; 16-lb., $36; 12-lb., $37, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Specifications have fallen off somewhat, and a part of mill capacities heretofore occupied on Shapes is now available for Billet making—a condition that should result in benefit to other finishing departments that are still crowded. Plans for the Corn Exchange National Bank Building, involving about 4500 tons of Structural Material, are now in course of preparation, bids on which, it is expected, will be invited soon. The Joliet Bridge & Iron Company has booked recent contracts for bridges and buildings, approximating 1000 tons of material. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—The congested condition of mill order books has been afforded no relief, but has, if anything, been augmented by an increasing demand. Prompt deliveries are hard to get from any source, and prices, $2 to $5, above the regular quotation of 1.70c., Pittsburgh, are obtainable by mills in position to make shipment. We quote for future deliveries, as follows: Tank Plate, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.86½c. to 2.06½c.; 3-16 in., 1.96½c. to 2.16½c.; Nos. 7 and 8 gauge, 2.01½c. to 2.21½c.; No. 9, 2.11½c. to 2.31½c.; Flange quality, in widths up to 100 in., 1.96½c. to 2.06½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.96½c. to 2.16½c.; Flange quality, 2.06½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.55c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—With dates of delivery receding farther and farther into the future, on account of the increasing volume of business, the status of the market as to prices is likely to remain unchanged for some time to come. On Black Sheets shipments are in most cases deferred eight weeks, and on Galvanized even twice that length of time. We quote, as follows: Blue Annealed, No. 10, 2.01½c.; No. 12, 2.06½c.; No. 14, 2.11½c.; No. 16, 2.21½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.81½c.; Nos. 15 and 16, 3.01½c.; Nos. 17 to 21, 3.16½c.; Nos. 22 to 24, 3.31½c.; Nos. 25 and 26, 3.51½c.; No. 27, 3.71½c.; No. 28, 3.91½c.; No. 30, 4.41½c.; Sheets from store: Blue Annealed, No. 12, 2.30c.; No. 14, 2.35c.; No. 16, 2.45c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c. Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.75c. to 3.95c.; No. 28, 4.10c.; No. 30, 4.65c. to 4.70c.

Bars.—A plentiful supply of specifications, together with the usual amount of new orders, furnishes steadiness to the market and a full measure of activity to the mills. No change either in Steel or Iron Bars is noted. Quotations are as follows: Iron Bars, 1.81½c. to 1.86½c.; Steel Bars, 1.76½c., both half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.86½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The pressure on the mills for belated deliveries is unabated, and in view of the continued flow of orders it is unlikely that the present congestion will be relieved for weeks to come. The principal mills are already months behind with shipments. Discounts on car lots, Chicago, are as follows: Black Steel Pipe, 74.35 on the base sizes, ⅜ to 3 in., and Galvanized, 64.35. From store in small lots, Chicago jobbers now quote 72½ per cent. on Black Steel Pipe, ⅜ to 6 in. Iron Pipe is held in advance from four to five points above these prices.

Boiler Tubes.—While Tube shipments are not so much deferred as Pipe, yet the demand is strong enough to prevent stock accumulation at the mills. Jobbers report a good demand from store stocks. Mill quotations are as follows on the base sizes: 2¾ to 3 in., in carload lots, Steel Tubes, 65.35; Iron, 52.35; Seamless, 49.35; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	40	35	42½
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	30
2¾ to 3 in.	60	47½	42½
6 in. and larger	50	35	..

Merchant Steel.—An even steadiness of demand continues that affords no ground for complaint. No changes as to price or other conditions are reported. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.96½c.; Iron Finish, up to 1½ x ½ in., 1.91½c.; Iron Finish, 1½ x ½ in. and larger, 1.76½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.26½c., and 1⅛-in. and larger, 2.16½c.; Smooth Finished Machinery Steel, 2.16½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 2.06½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.31½c.; Railroad Spring, 1.96½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting,

50 per cent. off in car lots and 45 per cent. in less than car lots, base territory.

Cast Iron Pipe.—Hesitancy on the part of municipalities to enter the market at prevailing prices for anything more than necessary extension requirements is responsible for present quietness in Pipe. The only tonnage of this kind now in sight is an inquiry from Salt Lake City for 3000 tons of Water Pipe, bids to open March 7. There is no change in prices, which are quoted as follows, per net ton: Water Pipe, 4-in., $38 to $39; 6 to 12 in., $37 to $38; 16-in. and up, $36 to $37, with $1 extra for Gas Pipe.

Coke.—A brisk demand for spot delivery was precipitated by recent storms that added to the much complained of car shortage and seriously retarded shipments. The effects, however, were merely temporary, and though productive of inconvenience have no special significance. Prices are unchanged. Connellsville 72-hr. Coke is quoted at $4.25 and $4.50 per car lots at the ovens; By-Product, $7.15, f.o.b. Chicago, prompt delivery.

Old Material.—Depressing influences still control the Scrap market, and the general list is lower. The big buyers are all well supplied, and offerings continue to exceed the demand. No signs of a reaction that would check the downward movement are yet in sight. The following quotations are on gross ton lots, f.o.b. Chicago:

Old Iron Rails	$25.00 to $26.00
Old Steel Rails, 4 ft. and over	19.00 to 19.50
Old Steel Rails, less than 4 ft.	18.00 to 18.50
Heavy Relaying Rails, subject to inspection, 50 lb. and under	31.00 to 32.00
Old Car Wheels	23.50 to 24.00
Heavy Melting Steel Scrap	16.00 to 16.50
Frogs, Switches and Guards	16.50 to 17.00
Mixed Steel	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates	$21.50 to $22.00
Iron Car Axles	26.50 to 27.00
Steel Car Axles	22.00 to 22.50
No. 1 Railroad Wrought	15.50 to 16.00
No. 2 Railroad Wrought	14.50 to 15.00
Railway Springs	16.00 to 16.50
Locomotive Tires, smooth	16.50 to 17.00
No. 1 Dealers' Forge	12.50 to 13.00
Mixed Busheling	11.00 to 11.50
Iron Axle Turnings	11.25 to 11.75
Soft Steel Axle Turnings	11.25 to 11.75
Machine Shop Turnings	11.25 to 11.75
Cast Borings	9.00 to 9.50
Mixed Borings, &c	9.00 to 9.50
No. 1 Mill	10.00 to 10.50
No. 2 Mill	9.00 to 9.50
No. 1 Boilers, cut to Sheets and Rings	11.00 to 11.50
No. 1 Cast Scrap	18.00 to 18.50
Stove Plate and Light Cast Scrap	14.50 to 15.00
Railroad Malleable	16.00 to 16.50
Agricultural Malleable	15.00 to 16.00

Cincinnati.

FIFTH AND MAIN STS., February 13, 1907.—(*By Telegraph.*)

Pig Iron.—Appearances indicate that buying for the last half has quieted down somewhat, with considerably more interest manifested in Iron for nearby delivery. As a general proposition, however, the situation is practically unchanged, and quotations, as shown last week, still obtain. Reports are current regarding a vast improvement in the car situation in the South, and that shipments are coming forward in a fairly satisfactory manner. An investigation along this line shows that the facts in the case do not corroborate these reports, and that a very small percentage of the Iron is being moved from furnace yards. In addition to this, the sidings are all full of loaded cars awaiting shipment, so that it is nothing out of the ordinary for a shipment to be from 30 to 40 days reaching this city from Birmingham. Spot prices, which practically cover through the first quarter, continue to be well established at $23, Birmingham, 1800 tons for February and March delivery, having gone into Chicago territory at this figure, with no sales reported below. Northern Iron is in strong demand, particularly for the last half, with High Silicon grades quite active. There are several inquiries from melters throughout the territory for 1000 tons each, covering early delivery. Freight rates from the Hanging Rock District to Cincinnati are $1.15, and from Birmingham $3. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$26.50 to $27.00
Southern Coke, No. 2	26.00 to 26.50
Southern Coke, No. 3	25.50 to 26.00
Southern Coke, No. 4	25.00 to 25.50
Southern Coke, No. 1 Soft	26.50 to 27.00
Southern Coke, No. 2 Soft	26.00 to 26.50
Southern Coke, Gray Forge	23.00 to 23.50
Southern Coke, Mottled	22.00 to 22.50
Ohio Silvery, 8 per cent. Silicon	31.15 to 31.65
Lake Superior Coke, No. 1	26.65 to 27.15
Lake Superior Coke, No. 2	26.15 to 26.65
Lake Superior Coke, No. 3	25.65 to 26.15
Car Wheel Irons.	
Standard Southern Car Wheel	$29.00 to $29.50
Lake Superior Car Wheel	27.50 to 28.00

Coke.—The market is somewhat quieter but with prices holding firm and well established. We quote the best grades of Connellville and Virginia Foundry from $4 to $4.50, f.o.b. ovens.

Finished Iron and Steel.—The demand is strong and prices are well maintained. The mills are said to be well covered for months to come. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.93c., with half extras; the same, in smaller lots, 2.10c., with full extras; Steel Bars, in carload lots, 1.73c., with half extras; the same, in smaller lots, 1.95c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-in. and heavier, 1.83c., in carload lots; in smaller lots, 2c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.93c., in carload lots.

Old Material.—The demand appears to have eased up a little and the market is a shade more quiet. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton	$17.75 to $18.25
Cast Borings, net ton	9.50 to 9.75
Steel Turnings, net ton	11.75 to 12.75
No. 1 Cast Scrap, net ton	16.75 to 17.75
Old Iron Axles, net ton	26.75 to 27.75
Old Iron Rails, gross ton	27.00 to 27.50
Old Steel Rails, long, gross ton	19.25 to 20.25
Relaying Rails, 56 lb. and up, gross ton	28.75 to 29.75
Old Car Wheels, gross ton	22.75 to 23.25
Low Phosphorus Scrap, gross ton	21.25 to 21.75

Philadelphia.

PHILADELPHIA, PA., February 12, 1907.

The market has had somewhat of a dull appearance during the past week or two, but prices show little or no change. There is probably a tendency to get away from the extreme high figures, particularly for spot deliveries, although there is no material increase in the supply, but, somehow or other, buyers manage to fill their requirements without paying the extreme premiums which were exacted until recently. This is in a measure due to the steady supply of foreign Iron, and also, to some extent, to shipments from the South and West. Sales have been mostly for small tonnages, showing that consumers are getting better deliveries, and there has therefore been less necessity for additional purchases to help them out. As regards contracts for deliveries during the last half of the year, there is a feeling of indifference on the part of both buyers and sellers. The high figures which are now quoted offer but little inducement for buyers to make contracts so far in advance; consequently they are assuming an observant rather than an aggressive attitude. On the part of sellers it may also be said that they see no use in trying to force business for which they have no immediate need, and as there are no evidences that prices will be lower they also are disposed to maintain a waiting attitude. Present conditions are good enough, and as there is nothing in sight to indicate any material change it is quite probable that the market will settle at something around to-day's figures, subject, of course, to any unforeseen developments, favorable or the reverse.

Pig Iron.—As already stated, the tonnage changing hands is less than it has been for a good many weeks, but that will make but little difference as long as consumption takes up everything that is available. This appears to be one of the probabilities, so that makers of Pig Iron are not likely to change their attitude, unless for reasons not now apparent. A good many sales have been made of small lots of Foundry Iron in carload to 100-ton lots; in Gray Forge of larger quantities, and of Basic in from 1000 to 5000 ton lots, when it can be had for delivery within the next 60 or 90 days. Prices, of course, depend a great deal upon the circumstances in each particular case. Spot lots of No. 2 Foundry bring about $26 to $26.50, and for the last half of the year $24 to $24.25. Basic Iron is more unsettled than almost any other grade, the scarcity for early delivery being almost greater than at any time during the past several months. Sales have been made at $24 for second quarter, but spot Iron would bring about $25. There is not much doing in this grade for the last half of the year, consumers having bought a considerable quantity some time ago, and are now inclined to wait until they can see a little further ahead, although $23 to $23.50, at furnace, is about what is asked for the third quarter. The fourth quarter seems to be neglected, but it is likely that something less than $23 might be done for that delivery. There is a good deal of Low Phosphorus wanted, and business is likely to be closed for large lots, sellers quoting $27, furnace, with a probability that something will be done at about $26.50. The following quotations are a fair representation of prices for delivery on the dates named in eastern Pennsylvania and adjoining territory:

First Half 1907.

No. 2 X Foundry	$26.00 to $26.50
Standard Gray Forge	22.50 to 23.25
Basic	24.50 to 25.00
Low Phosphorus	26.50 to 27.00
Malleable	25.50 to 26.00
Middlesbrough No. 3, on dock	22.50 to 23.00
Scotch, on dock	25.00 to 25.25

Last Half 1907.

No. 1 X Foundry	$25.00 to $25.50
No. 2 X Foundry	23.75 to 24.50
No. 2 Plain	23.00 to 23.25
Standard Gray Forge	22.00 to 22.50
Basic	23.25 to 23.75
Low Phosphorus	26.50 to 27.00
Malleable	24.00 to 24.50

Ferro Alloys.—Prices seem to be working toward lower figures, and considerably less than $70 is mentioned for Ferromanganese for shipment during the last half of the year. Spot lots and first half are quoted anywhere from $72 to $74 and Ferrosilicon, $108 to $112.

Steel.—New business is rather slow, but consumption is maintained at its highest limits. Specifications are prompt, so that the mills have plenty of work and could continue two or three months more if necessary. Prices are unchanged, at $33 to $34 for Soft Steel and $36 to $40 for Forging Steel.

Plates.—There is a good demand, particularly for quick deliveries, but mills are still hampered by the delays in getting deliveries of Pig Iron and other raw materials. Specifications are somewhat urgent and the general situation is very favorable at unchanged prices, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	2.13½	2.18½
Flange or Boiler Steel	2.23½	2.28½
Marine	2.53½	2.58½
Locomotive Firebox Steel	2.63½	2.68½

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—There are no special features in this branch, although there is a good general demand which keeps the mills actively employed at 1.83½c. to 2c. for Beams, Angles and Channels, &c.

Bars.—There is little of interest to report under this heading, the situation being in all respects unchanged. New business is fairly active, and specifications on old contracts are somewhat urgent, so that mills have plenty of work. Prices are steady at 1.93½c. for Best Refined Iron and about the same for Steel Bars on prompt shipments.

Sheets.—The demand is unusually active and mills have all they can do to meet the demand for prompt shipments. Prices, however, are unchanged, as follows, for mill shipments, and a tenth additional for small quantities: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—There is hardly any change in the situation. Prices appear to be maintained, but the demand is somewhat languid, and the market would not stand much pressure. Prices are considered high, but holders are not disposed to yield anything, so that bids and offers for deliveries in buyers' yards are about as follows:

Steel Crops and Rails	$18.75 to $19.00
No. 1 Steel Scrap	18.50 to 18.75
Low Phosphorus	22.50 to 23.00
Old Steel Axles	21.75 to 22.25
Old Iron Axles	31.00 to 32.00
Old Iron Rails	27.00 to 27.50
Old Car Wheels	23.00 to 23.25
Choice No. 1 R. R. Wrought	21.50 to 22.50
No. 1 Yard Scrap	19.50 to 20.50
Long and Short	18.50 to 19.00
Machinery Scrap	22.00 to 22.50
Wrought Iron Pipe	16.00 to 16.50
No. 1 Forge Fire Scrap	16.75 to 17.25
No. 2 Light	11.75 to 12.00
Wrought Turnings	16.00 to 16.50
Axle Turnings	17.00 to 17.50
Stove Plate	16.50 to 17.00
Cast Borings	14.00 to 14.50
Grate Bars	15.50 to 16.00

The business of Henry A. Hitner's Sons and the Kensington Wrought Iron Plate Washer Company, both of Philadelphia, Pa., was taken over February 1 by the Henry A. Hitner's Sons Company, a new corporation, which will continue the business at the same locations and along the same general lines, with improved facilities for handling the business of the several branches. Branch offices are located in New York, Baltimore, Md., and Eddystone, Pa. Joseph G. Hitner is president and general manager; Frederick M. Hitner, vice-president, and Charles K. Hibbs, secretary and treasurer.

The firm of H. P. Miller & Co., Real Estate Trust Building, Philadelphia, Pa., has been dissolved, to be succeeded by the firm of Miller, Foster & Co., who will act as selling agents for the Wilmington Iron Company's refined merchant bar iron, and also carry on a general business in the purchasing and selling of iron and steel scrap, together with railroad and contractors' equipment.

Pittsburgh.

PARK BUILDING, February 13, 1907.—(*By Telegraph.*)

Pig Iron.—Inquiries for Pig Iron are confined mostly to small lots, none of the large Steel interests being in the market at present as buyers. So far very little Standard Bessemer or Malleable Bessemer Iron for delivery in last half of this year has been sold, and there will be a large tonnage for delivery in that period. The large Steel interests are strongly opposed to a price of $21 to $21.50 for Bessemer Iron for such delivery, and will hardly agree to take in any Iron at that price, which is regarded as excessively high. We quote Bessemer Iron for spot shipment at $23, or slightly less; for second quarter delivery, $22, and for last half of the year delivery, $21 to $21.50, Valley furnace. We note a sale of 1500 tons of Basic Iron for March and April delivery at $22, Valley furnace. We quote Northern No. 2 Foundry for prompt shipment at $24 to $25, Valley furnace; for second quarter delivery about $23, and for last half delivery, $22 or less, Valley furnace. We quote Northern Forge Iron at $21.40, Valley furnace, or $22.25, Pittsburgh.

Steel.—New demand for Billets and Sheet and Tin Bars is light, but the market is firm. We quote Bessemer Billets at $29.50 to $30, and Open Hearth $31.50 to $32, Pittsburgh. We quote Sheet and Tin Bars in random lengths at $30, f.o.b. mill, Pittsburgh or Youngstown.

(*By Mail.*)

The volume of business in Finished Iron and Steel, particularly in Plates, Tubular goods, Iron and Steel Bars, Sheets, Tin Plates and Wire products, continues enormously heavy and should discredit the reports being circulated that the Iron trade is showing signs of a reaction. There never was a period in their history when the mills making the above products had as much tonnage on their books as they have at the present time, and the volume of new orders coming in is unusually large. Structural Steel, which was somewhat quiet in December and January, is showing more activity, and the tonnage entered so far this month shows a large increase over the corresponding period in the previous two months. The demand for Tubular goods is simply unprecedented. The pressure is so great on the National Tube Company that it has decided to start up its Youngstown mill, which has been idle for a year or longer. Engagements of the Sheet and Tin Plate interests for the next three or four months are unusually heavy, and all of them are very much behind in deliveries. The only weak spot in the whole market is Scrap, the demand for which is quiet and prices are somewhat weak. There is a good inquiry for Bessemer, Basic and Foundry Iron for second quarter delivery, and prices are reasonably firm. The supply of Bessemer Iron for early delivery is larger than for some time, due to the fact that the large Steel interests, notably the Steel Corporation, have not been buying Bessemer Iron in the open market for some time. While prices of Bessemer Iron are somewhat easier the market is reasonably firm on the basis of $22 at Valley furnace for second quarter and $21 to $21.50 for last half of the year delivery. It has been recognized for some time that prices of Pig Iron are disproportionately high, and a recession of $2 to $3 a ton on all grades, if it would come gradually, would be a benefit to the trade instead of an injury. The market on Pig Iron and some lines of Finished Iron and Steel has been out of joint for months, and a readjustment will have to come sooner or later.

Ferromanganese.—There is some demand, and we quote foreign 80 per cent. for prompt delivery at $75 to $77, Pittsburgh. For forward delivery prices are much lower, $70, Pittsburgh, having been quoted on large lots and declined. Opinion is divided as to the future of the market, some believing that prices will be better, while others think that Ferro will be much lower for delivery in the summer months than it is now.

Muck Bar.—There has been an active inquiry for Muck Bar for some time, and the supply is very limited, most makers needing their entire product in their own finishing mills. We note sales of 3500 to 4000 tons of Muck Bar, made from all Pig Iron, part of which was Eastern Bar, at $36.50 to $37, Pittsburgh. Prices on Bar made from part Scrap are much lower, and it is quoted at $32 to $33, Pittsburgh.

Rods.—There is some inquiry for Rods, but the supply

for the open market is very limited, and high prices are ruling. We quote Bessemer Rods at $37 to $38, and Open Hearth about $39, Pittsburgh, for prompt delivery. For forward delivery, it is probable that somewhat lower prices would be named.

Skelp.—The great activity in the Pipe trade is naturally causing an enormous demand for Skelp, all the mills being filled up with tonnage for some months ahead, and prices are very firm, while prompt deliveries are hard to obtain. We have again slightly advanced our prices, and quote, f.o.b. Pittsburgh: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.95c. to 2c.; Grooved Iron Skelp, 2.10c. to 2.15c.; Sheared Iron Skelp, 2.20c. to 2.25c.

Steel Rails.—As noted last week, new tonnage being placed in Steel Rails has been disappointing for some time. The Carnegie Steel Company took orders in the past week for upward of 20,000 tons of Steam Rails and we note that a good deal of tonnage is being inquired for, but it materializes very slowly. We quote Light Rails as follows: $33 to $34 for 20 to 45 lb.; $34 to $35 for 16-lb., and $35 to $36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at $28, at mill.

Structural Material.—One of the largest shipments of Structural Steel that ever left Pittsburgh was sent out last week by the McClintic-Marshall Construction Company over the Lake Erie and Lake Shore roads to Hammond, Ind., consisting of 50 cars of fabricated material for the new Steel car plant being built there by the Standard Steel Car Company, the contract for the buildings, requiring about 4000 tons, having been secured by the former company some time ago. The Fort Pitt Bridge Works has secured a contract from the Long Island Railroad for about 3500 tons of bridge work, another from the New York, New Haven & Hartford for about 2500 tons; also a contract for a large amount of bridge work for the Central Railroad of New Jersey, and has recently finished a 4½-mile extension to the Forest Hills Line of the Boston Elevated Railway and has further taken a contract from the same company for a large quantity of bridge material. Inquiries for Structural work are decidedly better, the tonnage entered by the shops in January having been heavier than in December. Prices are very firm and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—The Carbon Steel Company is now rolling the acid Open Hearth Plates for an East River bridge, a contract for 15,000 tons having been taken some time ago. New tonnage is piling into the mills in enormous volume, and they seem to be getting further behind in deliveries. As high as 2.10c., Pittsburgh, is being quoted for Sheared Plates, Tank quality, and it is stated that some business has been entered at this price. The Carnegie Steel Company will not accept orders except for random delivery, and has its capacity sold up for six months or longer. There seems to be a shortage in Plate capacity, and it is not unlikely that one or two mills will be built in the Pittsburgh District within the next year. Prices are very firm, and we quote: Tank Plate, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—New tonnage in both Black and Galvanized Sheets continues heavy, and the mills are not able to show any improvement in deliveries. Prices are very firm, and there is some talk of an advance in Black Sheets before long. We quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.: Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 Gauge Painted Roofing Sheets at $1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.25 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—A fair amount of new tonnage is being placed right along in Hoops and Bands, but most large consumers covered their requirements some time ago and are now specifying liberally against these contracts. For reasonably prompt delivery premiums of $2 a ton are being paid for Steel Hoops and Bands. Official prices for indefinite delivery are as follows: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel car. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—The leading Tin Plate mills have a heavy tonnage on their books for first and second quarter delivery, and a good deal of business is being placed for third quarter delivery at a premium of 10c. a box. The supply of Tin Bars is fairly satisfactory, but is not as good yet as the mills that have to buy Bars in the open market would like to have it. It is understood that the engagements of the American Sheet & Tin Plate Company and leading independent mills for the next four or five months are exceedingly heavy, and this, with high prices of Tin and Tin Bars, may possibly lead to an official advance in prices before long, but as yet nothing official regarding this has been given out. We quote $3.90 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Iron and Steel Bars.—A moderate tonnage is being placed in both Iron and Steel Bars, and with heavy specifications on contracts the mills are making record breaking shipments, but are not catching up on deliveries to any great extent. Several of the leading Steel Bar interests have their product sold up to July 1 and are not disposed to enter business for specified delivery prior to that date. We quote Refined Iron Bars at 1.80c., Pittsburgh, and Steel Bars at 1.60c., base, half extras, f.o.b. Pittsburgh, these prices being for forward delivery. For prompt shipment premiums of $1 and $2 a ton are asked.

Railroad Spikes.—The demand for standard sizes—that is, 5½ x 9-16 in.—is not quite as heavy as it was; but, on the smaller sizes, ranging from 2½ x ⅝ to 4 x ½ in. is very heavy, and the mills are much behind in deliveries. We quote standard sizes at $2.40 to $2.50, and the smaller sizes at $2.50 to $2.60 per 100 lb. For prompt shipment, $2.65 to $2.75 is quoted, but we are advised that none of the mills can make deliveries in less than 6 to 10 weeks.

Merchant Steel.—Slightly better deliveries are being made by the mills, and specifications on contracts are coming in very liberally, shipments being unusually heavy. Prices are very firm, and we quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. The demand for Shafting is reported active, and prices are fairly well maintained. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Spelter.—The demand, especially for prompt shipment, is greater than the supply, fancy prices having been paid on small spot lots. We quote prime grades of Western for forward delivery at 6.75c., St. Louis, equal to 6.87½c., Pittsburgh. It is said that for spot 7c., St. Louis, and higher has been paid.

Pipes and Tubes.—The demand for Pipe is simply enormous, and the mills are congested with tonnage. Among large contracts recently placed is one from the Southern Pacific Railroad for 400 miles of 8-in. Line Pipe for an oil line in California, and which was taken by the leading interest. The pressure has become so great that the National Tube Company is arranging to start up its Youngstown department, which has been idle for more than a year. It is expected to have this plant running by March 1 or before, and it will give the National Tube Company an additional output of about 5000 tons of Tubular goods per month. Other large Pipe tonnage is pending, which will require thousands of tons of Plates, and which will likely be placed in a short time. The great scarcity and high prices being charged for Skelp lead some in the trade to believe that another advance in Pipe is not improbable. The extreme discount on Merchant sizes of Iron Pipe is 70 and 5 per cent. off for ¾ to 6 in., and on Steel Pipe, 76 and 5 per cent. off, for carload lots to the large trade. Official discounts on Steel Pipe, which are shaded about one point or more to the large trade, are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
	%	%
⅛ to ¼ in.	67	51
⅜ in.	69	55
½ in.	71	59
⅝ to 6 in.	75	65
7 to 12 in.	70	55
Extra strong, plain ends:		
¼ to ⅜ in.	60	48
½ to 4 in.	67	55
4½ to 8 in.	63	51
Double extra strong, plain ends:		
½ to 8 in.	56	45

Official discounts on Iron Pipe, which are shaded one point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.

	Black. Per cent.	Galvanized. Per cent.
¾ to 6 in.	69 and 5	59 and 5
½ in.	64 and 5	52 and 5
⅝ in.	62 and 5	44 and 5
⅛ and ¼ in.	60 and 5	44 and 5
7 to 12 in.	64 and 5	49 and 5

Extra Heavy Iron Pipe, Plain Ends.

⅛, ¼ and ⅜ in.	64 and 5	42 and 5
½ to 4 in.	61 and 5	49 and 5
4½ to 8 in.	57 and 5	44 and 5

Boiler Tubes.—In sympathy with Pipe, the demand for Boiler Tubes is extremely active, and the mills are full of work. As noted last week, the tonnage being placed in Boiler Tubes is heavier now than before the recent advance in prices was made. Discounts are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	41	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	54	67
6 to 13 in.	42	59

Iron and Steel Scrap.—The demand for Scrap does not show any improvement, and the tone of the market continues weak. Leading consumers are pretty well filled up and are not in the mood for buying. The amount of Scrap pressing the market for sale is not large, but just now conditions seem to favor the buyer. We quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise stated: Heavy Melting Scrap, $18 to $18.25, for Pittsburgh, Steubenville or Sharon delivery; Old Steel Rails, short pieces, for Open Hearth purposes, $18.25; Old Steel Rails, rerollers, $19.50 to $20; Wrought Iron Turnings, $14.25; No. 1 Wrought Scrap, $19.50 to $19.75; No. 2 Wrought Scrap, $17.75 to $18. Bundled Sheet Scrap is held at about $16 to $16.25. Tin and Terne Plate Clippings are $18.50 to $19 per net ton. Low Phosphorous Melting Stock is held at about $22. Cast Iron Borings are $12.25; Old Car Wheels, $21.50 to $22; Steel Axles, $21.50. We can note sales of 6000 to 8000 tons of Heavy Steel Melting Scrap at $18 for forward delivery and about $18.25 for reasonably prompt shipment. Also a sale of about 250 tons of Bundled Sheet Scrap at about $16, Pittsburgh.

Coke.—Strictly Connellsville Furnace Coke for prompt delivery continues scarce and readily brings from $3.50 to $3.65 a ton at oven. We note sales of 75 to 100 cars for February shipment, most of it at the lower price. Connellsville 72-hr. Foundry Coke continues to bring $4.25 to $4.50 a ton at oven for prompt delivery. Grades of Coke made outside of the Connellsville region are offered at lower prices. The output continues heavy, the Upper and Lower Connellsville regions having made last week about 410,000 tons.

The Fort Pitt Bridge Works has leased 10 rooms, or nearly half of the fifth floor of the House Building, Smithfield and Water streets, Pittsburgh. The works of this company are at Canonsburg, Pa.

Birmingham.

BIRMINGHAM, ALA., February 10, 1907.

Pig Iron.—The market the past week has been extremely quiet, only a limited number of sales having been made and these all for small tonnage. One concern which sold 30,000 tons in January reports sales of only about 500 tons during the week. Other producers refuse to give figures, but admit that at present the market is exceedingly dull. Business has been gradually dropping off for the past three weeks, though apparently there has been no change in price, as the same quotations are being made to-day for last half delivery as were in effect January 1. For nearby deliveries the prices have weakened, as was to have been expected on the improvement of the transportation situation, and are about the same as last week. The promises of the railroads to furnish sufficient cars to move the accumulation of Iron in the yards here before the advance in freight rates on March 3 are not being compiled with. Cars are scarcer this week than at any time in the past month. That the railroads do not propose to lose any revenue through deferring the date on which the advance in freight was to go into effect is clearly shown by the new tariffs just issued and effective March 3. The rate of freight on Pig Iron and Cast Iron Pipe to Missouri River points is to be advanced 75c. per ton instead of the amount originally announced.

Cast Iron Pipe.—No orders for large tonnage have been booked by the foundries in this district in the past week, but the demand from small municipalities is still urgent, and the tonnage now being placed more than equals the production. Better prices, too, as a rule, are secured on this class of business than on larger contracts. On smaller sizes most of the foundries are more than three months behind on deliveries. Quotations on Water Pipe remain unchanged and are approximately as follows per net ton: 4 to 6 in., $35; 8 to 12 in., $33; over 12-in., average $30, with $1 per ton extra for Gas Pipe.

Old Material.—Conditions in the Scrap market are far from satisfactory to the dealers. The demand the past week has been very limited, and there are no indications of an early improvement. While prices on Wrought Scrap have been marked down about $1 per ton, this has not had the effect of moving the accumulation on the yards here. Heavy Melting Scrap is about the only thing that is moving, and the demand for this is much less urgent than at any time in the past several months. Quotations, while somewhat irregular, are about as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$21.50 to $22.00
Old Iron Axles	19.00 to 19.50
Old Steel Axles	17.50 to 18.50
Old Car Wheels	19.50 to 20.00
No. 1 Railroad Wrought	19.50 to 20.00
No. 2 Railroad Wrought	15.00 to 15.50
No. 1 Country Wrought	15.00 to 15.50
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	12.50 to 13.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	15.00 to 15.50
No. 1 Machinery Cast	15.50 to 16.00
Stove Pipe and Light Cast	12.00 to 12.50
Cast Borings	8.75 to 9.25

A matter of much interest to the industrial part of Alabama is a bill just introduced in the State Legislature prohibiting the running of freight trains on Sunday. Every possible pressure is being brought to bear by the railroads and Iron and Coal companies to defeat the measure, as it is only with the greatest difficulty that the business of this district is now being handled on the single tracked roads. The Governor and a majority of the Legislature were recent elected on an antirailroad ticket, and a number of rate laws have already been enacted which will work great hardships on the railroads of the State.

Cleveland.

CLEVELAND, OHIO, February 12, 1907.

Iron Ore.—Inquiries for spot Ore are still being made, but the available supply on the docks has been pretty well cleaned up, so that consumers are now having great trouble in finding any. The inquiries are especially numerous for Old Range Ores. Present indications are that about everything will be taken from the docks before the opening of navigation, and that the supplies of several kinds of Ore will be entirely exhausted at some of the furnaces before this season's Ore reaches the docks. Dealers who have been selling some spot Ore, but have no more to offer, declare that furnacemen who want any more Ore for shipment before navigation opens must pay a premium of at least 25c. a ton for it, and that it will be hard to pick up any even at the advanced price. Ore is moving fairly well from the docks, but the cold weather of the past two weeks has interfered with the movement somewhat. Few if any inquiries for 1907 delivery have been made the past week. Nominal quotations at Lake Erie docks are as follows, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.50.

Pig Iron.—Following the heavy buying movement for the second half, that subsided about two weeks ago, there has been scarcely an inquiry for last half Foundry Iron the past week. In spite of the inactivity prices remain firm, furnaces showing no inclination to do any shading on the present established price of $22, Valley furnace, for Northern Foundry No. 2 for last half delivery. Furnacemen declare that the furnaces are so well sold up for the last half that they are not anxious about disposing of the remainder of their output and for the same reason will hold firmly to the present prices. There is a large amount of tonnage yet to be placed by the foundries in this district, and those who have not yet bought will probably wait for awhile with the hope of finding the market a little lower. While there is a lull in the second half market there is quite a demand for Northern Foundry No. 2 for prompt shipment and for the second quarter. A number of foundries had not covered to the full amount of their requirements and must now find some small lots of Iron to piece out. Some sales have been made for prompt shipment at $25 and $26. Furnaces are still holding

Basic Iron at $21, Valley furnace, but are making no sales and receiving no inquiries. Furnacemen say that Steel makers refuse to buy Basic Iron at the present prices and that Billets must go up or Basic Iron down before they can hope to make any sales of importance. The Bessemer Iron market is also quiet, few inquiries being made for the last half delivery. The demand for Southern Iron for the last half is a little more active, quite a number of sales having been made in small lots the past week. The price is firm, at $18.50, Birmingham, although some furnaces are still asking $19. The Republic Iron & Steel Company reports that its Pioneer furnaces are all sold out for the third quarter. Shipments on Southern Iron are a little better than they were a few weeks ago. No further sales of Foreign are reported, although dealers are offering some for delivery early in March at $25.50 to $26, Cleveland. Some foundries in this district are asking furnaces to anticipate shipments on Northern Foundry Iron, which indicates that their supplies are pretty well melted up. Quotations for last half of 1907, f.o.b. Cleveland, are as follows:

Bessemer	$21.50 to $22.00
Northern Foundry, No. 1	22.50 to 23.00
Northern Foundry, No. 2	22.00 to 22.50
Northern Foundry, No. 3	21.50 to 22.00
Southern Foundry, No. 2	22.85 to 23.35
Gray Forge	21.00 to 21.50

Coke.—There is a fair demand for Coke for prompt shipment and for first half deliveries, and Furnace Coke is selling 10c. higher than a week ago. Deliveries are fairly good, except from West Virginia. The recent floods interfered seriously with railroad traffic in that State and the transportation lines have not yet got caught up with consignments. Furnace Coke is quoted at $3.75 to $3.85 at oven. Foundry Coke is selling at $4 at oven.

Finished Iron and Steel.—The market is firm in all lines and considerable tonnage in new contracts has been placed the past week, although the buying was probably not so heavy as during the previous week. Specifications are still coming in quite freely on contracts for Plates, Bars and Sheets, consumers specifying as far ahead as possible because of the slow deliveries. An important feature of the recent market conditions has been the development of a more urgent demand on the mills for deliveries. Deliveries are as bad and perhaps a little worse than a week ago, but consumers seem to be more anxious for deliveries than before and the complaints about delays are expected to increase as spring approaches. Because of the slow deliveries the local warehouses are still reaping a harvest, being crowded with orders for prompt delivery at out of stock prices. Some of the orders are for carload lots and over. The demand on small mills that have been booking orders for prompt shipment at premium prices has fallen off somewhat, but quite a number of small orders have been placed for Bars and Plates, at a premium of $5 to $7 a ton. The demand for Bars and Plates continues heavy, a number of new orders for future delivery being placed in the local market during the week. Deliveries are somewhat worse, the mills not promising shipment within 60 or 90 days. The mills are selling Iron Bars on the basis of 1.75c. to 1.80c., Pittsburgh, and Steel Bars at 1.60c., Pittsburgh. Local warehouses are getting 1.95c. to 2c. for Iron Bars out of stock and 1.95c. for Steel Bars. Forging Billets are scarce and one sale is noted at $43 for prompt shipment. Structural Material shows a little more activity than a week ago. The Youngstown Sheet & Tube Company is in the market for 4000 tons of material, mostly Plates, for the two new blast furnaces that it will erect during the present season. Contracts will probably be awarded this week. The Sheet situation shows no improvement as to deliveries and the demand is still heavy. Local stock prices on Sheets are unchanged, as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 2.90c.; No. 28 Galvanized, 4c.

Old Material.—The market continues very weak, there being practically no demand. Nominal prices, however, have not declined further, dealers asking the same as a week ago. Consumers bought heavily in December, and the supplies they contracted for are not yet exhausted. The supply is plentiful, all kinds of Old Material having been coming into the market more freely than was anticipated during the winter months. The following are dealers' prices to the trade per gross ton, f.o.b. Cleveland:

Old Steel Rails	$17.50 to $18.00
Old Iron Rails	23.50 to 24.50
Steel Car Axles	21.00 to 21.50
Old Car Wheels	21.00 to 21.50
Heavy Melting Steel	16.00 to 16.75
Railroad Malleable	17.50
Agricultural Malleable	15.50
Light Bundled Sheet Scrap	16.00 to 17.00
Bundled Tin Scrap	15.00 to 16.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$29.25 to $29.75
Cast Borings	9.50 to 10.00
Iron and Steel Turnings and Drillings	11.50 to 12.00
No. 1 Busheling	15.50
No. 1 Railroad Wrought	17.50 to 18.00
No. 1 Cast	17.00 to 18.00
Stove Plate	13.75 to 14.25

The Coal Market.

BY FREDERICK E. SAWARD.

It looks as though the consumer in all parts of the country was to pay more for his Bituminous Coal this year than he has done in the past year or two. There is every disposition on the part of the mining interests to get a better average price for the Coal at the mines, and the railroads have already announced an increase in the rate of freight on Coal. Producers say that the cost of Bituminous to the user throughout the country will bear a more even relation to operators' cost and charges when the spring prices come to be made. They have been on the average but little beyond cost in many districts for some time, even taking into consideration the advances which take place in the fall and winter, as against the summer prices. The uneven condition of mining and shipping facilities in the former period very often offsets the gain in price.

The demand for Bituminous Coal in New England is about normal for this time of year. Consumption goes on at a fast pace, as the weather conditions require a maximum amout of fuel. The local roads are badly blocked with freight, and eastbound shipments are moving very slowly. The railroad yards between Boston and the New York State line are crowded, particularly on the Boston & Maine and the Boston & Albany, while many inland towns are decidedly short of Coal, although a few miles off loaded cars may be standing waybilled to them. The recent snow storm and cold weather seem to have partially paralyzed the freight movement on those roads.

Soft Coal loaded at the New York ports continues to drag along, notwithstanding cold and stormy weather conditions. Consumers in most cases are comfortably stocked and seem to think that all danger of shortage is now over for the winter. Considering the large tonnage moved recently by most of the railroads, and the prospect of further improvement, this feeling is no doubt well founded.

Prices of Soft Coal at the mines, for prompt delivery, are as follows per ton of 2000 lb.:

Pennsylvania Railroad Coals.

Georges Creek	$1.90 to $2.00
Best Miller vein	1.50 to 1.60
Good Miller and Moshannon	1.20 to 1.30
Best gas coal, three-quarters lump	1.60 to 1.70
Best gas coal, run-of-mine	1.50 to 1.60
Best gas coal, slack	1.00 to 1.10
Ordinary Clearfield	1.20 to 1.25
Ordinary Latrobe	1.20 to 1.25

Baltimore & Ohio Railroad Coals.

Georges Creek	$1.90 to $2.00
Best Somerset	1.40 to 1.50
Somerset	1.20 to 1.25
West Virginia Freeport	1.10 to 1.20
Fairmont District, three-quarters lump	1.40 to 1.50
Fairmont District, run-of-mine	1.30 to 1.35
Fairmont District, slack	1.00 to 1.10

As far as the Anthracite steam sizes are concerned, it can be said that Pea Coal is as scarce as ever and goes promptly when offered if of ordinarily good quality and at figures at or about $3, f.o.b. loading ports. No. 1 Buckwheat has been scarce lately and buyers have not found it an easy matter to get either the price or the quality desired. Some cheaper grades are to be had at about $2.30, but quality fair to good commands $2.40 to $2.50 promptly, while Washery and Fresh Mined Buckwheat No. 2 is easy at fair prices. Some small lots are available at $1.65 to $1.70, f.o.b., and orders are not plentiful outside of contract needs. The higher grades are short of requirements, but the demand is not sufficient to create a shortage of the ordinary quality. Buckwheat No. 3 is easily secured at $1.30 to $1.40, at New York, with the demand about up to the supply.

In the Western country, where so much has been heard recently as to the short supply of fuel of all kinds, the situation is worse than ever. Following a week of milder weather, in which the railroads devoted themselves energetically to clearing their tracks, another storm and blizzard blocked them and made it necessary to do the work over again. There are from 200 to 400 cars loaded with Coal standing on side tracks at many division points in the Northwest. These cars are consigned to dealers and consumers, but are sidetracked, blocked up and utterly inaccessible, being surrounded with other loaded cars and requiring an immense amount of labor to extricate them from the maze in order to get them out where they could be forwarded.

As to freight rates on Soft Coal, it can be stated that, led by the Pennsylvania, the trunk line railroads will make a general increase in rates of 10 per cent. on April 1. President McCrea of the Pennsylvania Railroad is credited with having taken the matter up with President Baer of the Reading & Jersey Central, and with President Johnson of the Norfolk & Western. The Coal companies in Maryland, Virginia, West Virginia and Pennsylvania have been given to understand that there will be no adherence to the present rates after April 1. The rate to tidewater will be increased, it is said, about 15 per cent. Increased cost of operation is given as the reason for the advance in rates.

The season rate for carrying on the lakes has been fixed at last year's figures—namely, 30c. a ton from Lake Erie

ports to the head of the lakes and 40c. to Chicago, Milwaukee, &c. That the movement of Coal up the lakes will be very heavy during the coming season is certain, and most of the leading shippers want to hold off on season chartering for a little while longer. By that time they expect to be in shape to get a good line on the condition of the docks at the upper lake ports and know more about their requirements in the way of season tonnage. Some of the shippers do not expect to do any season chartering until the latter part of February.

Metal Market.

NEW YORK, February 13, 1907.

Pig Tin.—While there has been a good business, the amount of which ranged between 400 and 500 tons, the volume was not up to that of the week previous. On the 7th Tin was sold at 42.40c., and on the 8th a very fair business was done at 42.25c. to 42.40c. On this date there was also some business done in nearby shipments, which went at 41.90c., and for very prompt shipment 42.25c. was obtained. On the 11th there was a good inquiry, but not much business developed, probably on account of the holiday on the 12th. Tin was sold, however, at 42.50c., and some sales were made *ex* Mesaba, which arrived to-day, at 42.37½c. To-day's price is 42.40c. The bulk of the Tin which is on the way at present has already been sold, and while there is plenty to supply present needs the surplus is so slight that it will be easy to maintain an artificial stimulus to the market until after the first week of March. In all but 659 tons have arrived but there are afloat for American ports 2630 tons. The London market is again lower this week and the closing price on that exchange to-day is £191 15s. for spot and £191 for futures. There is in that market an aggressive bear clique which is seemingly very persistent in hammering the market, and not without good success. While prices have not declined much, still the advance has been held in check and there are some who profess to see the hand of certain American consuming interests in these operations. There is no gainsaying the fact that the London market has been exceptionally steady, considering its irregularities in the past, during the first six weeks of this year.

Copper.—The market is higher, and for Lake, 25.12½c. to 25.37½c. is quoted; for Electrolytic, 24.87½c. to 25.25c., and for Casting Grades, 24.50c. to 25c. For nearby shipments, however, premiums above these prices must be paid. We learn of at least one sale during the week of a round lot of Electrolytic at 25c. for early March delivery. The European market to-day is firmer, London closing at £108 for spot, £109 for futures, while Best Selected is held at £114. Advices from the mining camps are to the effect that the fuel situation in the Southwest is improving, and the acute stage has probably been passed. In the Boundary District of Canada, however, fuel is scarce, and the same applies, although in a less degree, to the Butte District. There seems to be more publicity given to the cessation of construction in electrical lines than the facts would warrant, but it is true that in several lines a marked falling off in the amount of Copper consumed is expected. The exports so far this month are small, amounting to but 3223 tons. In a retail way prices are unchanged, cask lots of Lake being held at 26c., and Electrolytic at 25.75c.

Pig Lead.—Business has quieted down somewhat, although prices are unchanged. For spot delivery 6.30c. to 6.32½c. is quoted, and shipments can be had at 6.25c. In St. Louis the market is steady at 6.10c. The continued cold and stormy weather is interfering with consumption to a degree, enabling manufacturers to make some headway on back orders. The American Smelting & Refining Company continues to accept orders only on the basis of the price current on date of shipment, which will be some time in April. The price governing old contracts is also unchanged at 6c. The London market closes to-day at £19 10s.

Spelter.—The high premiums, which have been paid for prompt delivery of Spelter, are, in a measure, disappearing. Nearby deliveries from the West can be had at 7c., and future deliveries at 6.90c. In St. Louis the market is higher at 6.75c. to 6.80c., and considerable business has been done at the latter figure.

Antimony.—Prices continue firm. Slight concessions are still offered in some quarters, and the general run of the market is represented by 26c. for Cookson's, 25c. for Hallett's and 24c. to 25c. for other brands.

Nickel.—Prices are unchanged, large lots being sold at 45c.; smaller quantities at 55c. to 65c.

Ferroalloys.—Ferromanganese is somewhat steadier, but $70 continues to be quoted, f.o.b. Baltimore, which is equivalent to about $72, f.o.b. Pittsburgh. There is a good demand at this price. The price of Ferrosilicon is unchanged at $110, f.o.b. Atlantic ports, and in some cases $112 is asked for reasonably prompt shipments. From Europe advices are to the effect that the supply, particularly from Norway, is seriously interfered with, on account of the extremely cold weather which has prevailed, making the water power almost useless.

Tin Plate.—There seems to be a better demand for Tin Plate, especially Coke Plate. The price is unchanged at $3.90, f.o.b. Pittsburgh, and $4.09, f.o.b. New York. The European market is still weak, and the price on Oil Plates has declined further. For 18¾ x 14 in., which was held at 15s. 4½d. a month ago, the price has now declined to 14s. 10½d.

Old Metals.—Dealers' selling prices on Old Metals continue to advance, not only on account of the increased price of raw material, but also due to the fact that the demand has improved, and there is more of a scarcity. We quote:

	Cents.
Copper, Heavy Cut and Crucible	24.00 to 24.50
Copper, Heavy and Wire	23.00 to 23.50
Copper, Light and Bottoms	21.00 to 21.50
Brass, Heavy	16.50 to 17.00
Brass, Light	13.50 to 14.00
Heavy Machine Composition	21.25 to 21.75
Clean Brass Turnings	15.00 to 15.50
Composition Turnings	18.00 to 18.50
Lead, Heavy	6.00
Tea Lead	5.70
Zinc Scrap	5.00

New York.

NEW YORK, February 13, 1907.

Pig Iron.—During the past week the market in this district has been very quiet. We quote spot Northern Iron, in small lots, $25.50 to $26.50 for No. 1 Foundry, and $24.50 to $25 for No. 2 Foundry. For the first half we quote $25.50 to $26 for No. 1 Foundry, $24 to $25 for No. 2 Foundry and $23.50 to $24 for No. 2 Plain. For the second half we quote $23.50 to $24 for No. 2 Foundry.

Steel Rails.—Orders for trolley lines have been given amounting to about 8000 tons and several steam roads have placed small additional requirements, including 1000 tons for the Lehigh Valley, 1600 tons for the New York, New Haven & Hartford and 1000 tons for the Long Island Railroad. A 6000-ton rail order for Bolivia has been closed and a Philippine line will require several thousand tons. The most noteworthy contract is for 50,000 tons for lines under construction abroad.

Structural Material.—The largest recent contract for bridge work is for the Bolivia Railway Company. It calls for 208 bridges of spans, from 20 to 100 ft., and will require 1800 to 2000 tons of Steel. For the Philippine railroad, built under contract with J. G. White & Co., about 300 bridges will be required. The American Bridge Company has taken the contract for the Paulsen Building, Spokane, Wash., about 1200 tons, and two buildings have been added to the San Francisco list in the past week, requiring, respectively, 150 and 450 tons. The Norfolk & Western Railroad has placed 3000 tons of bridge work, of which a portion was taken by the McClintic-Marshall Construction Company. The Erie Road is in the market for 2500 tons of bridges, and some further lettings of relatively small tonnage have been made by the New Haven Road. In general, railroads show a hesitancy about entering into further contracts. Plans for a large tonnage have been made, but the appropriations are still awaited. The Structural mills are making good deliveries on Shapes, and specifications keep up to the better rate shown in January. We quote mill shipments, tidewater deliveries, as follows: Beams, Channels, Angles and Zees. 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made from stock of material cut to length at 2¼c. to 2½c.

Bars.—A somewhat better demand is reported for Bar Iron, with sales of a considerable tonnage for delivery over the next 60 to 90 days. The demand for Steel Bars is also quite strong, with the leading mills unable to make deliveries inside of 90 days. Quotations are continued at 1.84½c. to 1.94½c., tidewater, for Bar Iron, and 1.74½c. to 1.94½c., tidewater, for Steel Bars, according to specifications, time of delivery, &c.

Plates.—The inquiry has shown little improvement, as the local fabricating shops are not actively employed and the consumption is therefore running rather light. Some interest is manifested in projects for water works extensions in this locality which, when decided upon definitely, will require a considerable quantity of Riveted Pipe, for which quite a large quantity of Plates will be needed. The range of quotations, tidewater delivery, taking the low price on long deliveries of Western mills and the rate made by Eastern mills, is as follows: Sheared Tank Plates, 1.84½c. to 2.14½c.; Flange Plates, 1.94½c. to 2.24½c.; Marine Plates, 2.24½c. to 2.44½c.; Firebox Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Bids were opened on the proposed purchases of Pipe mentioned in this report last week. The New York City work went to a contractor. In the case of the Yonkers letting the lowest bid received was $34.95. On the Newark letting the lowest bid was $36.68. The great New Orleans contract was awarded in its entirety to R. D. Wood & Co., Philadelphia, although the trade had thought that the portion calling for deliveries in 1908 would be withheld. The prices are understood to be $33 per net ton, New

Orleans, for 1907 delivery, and $32 for 1908. Inquiries for Pipe are still numerous, and prospects continue as bright as at any time previously. Quotations are continued on the basis of $35 to $36 for 6-in. Pipe per net ton, at tidewater.

Old Material.—The feature of the past week has been the sale by railroad companies of their January accumulations, comprising about 10,000 tons of various kinds of Old Material, taken mainly by dealers. The demand for Steel Scrap has been strong, especially from brokers who are still short on contracts made some time ago on which deliveries are being demanded. Heavy Cast Scrap, Stove Plate and Borings also continue in good demand. The severe winter weather now prevailing is curtailing the supply of Scrap of many kinds, as had been expected, and dealers are expecting a very firm market for some time, if not higher prices. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for Melting	$16.25 to $16.75
Heavy Melting Steel Scrap	16.25 to 16.75
Old Steel Rails, rerolling lengths	19.50 to 20.00
Relaying Rails	28.00 to 29.00
Old Iron Rails	24.00 to 25.00
Standard Hammered Iron Car Axles	28.50 to 29.50
Old Steel Car Axles	21.00 to 22.00
No. 1 Railroad Wrought	21.00 to 21.50
Iron Track Scrap	18.00 to 18.50
No. 1 Yard Wrought, long	18.50 to 19.00
No. 1 Yard Wrought, short	17.50 to 18.00
Wrought Pipe	14.50 to 15.00
Light Iron	11.00 to 11.50
Cast Borings	12.00 to 12.50
Wrought Turnings	14.50 to 15.00
Old Car Wheels	22.50 to 23.00
No. 1 Heavy Cast, broken up	19.00 to 20.00
Stove Plate	16.00 to 16.50
Grate Bars	14.00 to 14.50
Malleable Cast	18.00 to 19.00

ron and Industrial Stocks.

NEW YORK, February 13, 1907.

The stock market for the past week has been on a more even keel. The adverse winds have subsided, and weather conditions have been somewhat more propitious for those who are afloat on the sea of speculation. Transactions in iron and industrial stocks have not been large and fluctuations have been confined to rather narrow limits. In the main the tendency has been in an upward direction. Tuesday of this week was a holiday and exchanges were closed. The range of prices on active stocks from Thursday of last week to Monday of the present week was as follows: United States Steel common 44¼ to 45⅝, preferred 104⅝ to 105½; Car & Foundry common 42½ to 44⅜; Locomotive common 71 ex-dividend to 73; Steel Foundries preferred 43 to 44; Colorado Fuel 48⅛ to 49⅞; Pressed Steel common 49 to 51⅞; Railway Spring common 52⅞ to 53½; Republic common 34¼ to 36¼, preferred 98 to 98¾; Sloss-Sheffield common 69 to 72; Cast Iron Pipe common 45⅛ ex-dividend to 47¼. Some small transactions occurred in Tennessee Coal at 155 to 155⅜, showing quite a reduction on previously reported sales. Last transactions up to 1.30 p. m. to-day are reported at the following prices: United States Steel common 46, preferred 105⅜; Car & Foundry common 44¾, preferred 103; Locomotive common 75, preferred 111; Steel Foundries common, 9¾, preferred 43; Colorado Fuel 50⅛; Pressed Steel common 53, preferred 98; Railway Spring common 54¾; Republic common 36¼, preferred 98½; Sloss-Sheffield common 72; Tennessee coal 155⅜; Cast Iron Pipe common 47⅜, preferred 87; Can common 6⅛, preferred 55.

American Imports of British Pig Iron.

GLASGOW, January 31, 1907.—The price of pig iron as reflected in warrants has fallen off curiously here since the year opened—curiously, because the demand has not abated either on home or export account. At the close of 1906 Cleveland warrants were 62 shillings, Scotch 67 shillings 6 pence and Cumberland hematite 80 shillings 3 pence. These prices continued into January, and in that month Cleveland reached to 63 shillings 6 pence, but to-day is back to 56 shillings 6 pence. Scotch is 63 shillings and Cumberland hematite is 74 shillings. Now this drop in Cleveland warrants is concurrent with a reduction of 86,300 tons in the stocks of No. 3 in the warrant store, but with no reduction in the activity at the furnaces. The decline is attributed to depressing cables from the United States, where signs of decrease in consumption are said to be apparent. Yet since the slight decline in spot prices was cabled from your side some considerable orders have been placed here for shipment to the United States. Only yesterday a steamer was chartered to load 4500 tons of Cleveland iron on the Tees for Baltimore at 6 shillings freight.

As there seems to have been a good deal of misrepresentation on both sides of the water as to the actual quantities of pig iron which have been shipped from Cleveland and Glasgow to the United States since buying began, I have followed up the charters. I find that from September, 1906, to the end of January, 1907, 36 steamers were chartered to carry about 155,000 tons. Of these 16 loaded for Philadelphia at freights from 5s. 9d. to 6s. 6d. per ton; 9 loaded for New York at freights from 6s. to 6s. 6d. per ton; 6 loaded for Baltimore at freights from 6s. to 6s. 7½d per ton; 1 loaded for Boston at 6s. 6d. freight; 3 loaded for New Orleans at 6s. 9d. (from the Tees) and 7s. 3d. (from the Clyde); and 1 loaded (from the Tees) for Newport News at 6s. 4½d. Besides these shipments by specially chartered vessels, probably from 40,000 to 50,000 tons have been shipped by the regular liners in small weekly parcels from the Clyde and Mersey. This gives about 200,000 tons in all. But that total does not represent the whole of the American purchases, for a good many of the contracts extend into February and March.

Buying Follows Bearish Cables.

Whether buying has or has not actually stopped or is about to stop you can tell better on your side than we can here, but it is curious that buying always seems to follow a reported drop on your side. As Cleveland iron is now about 7s. per ton from the top, there is more margin for American consumers to import, but makers generally have not followed the course of warrants all the way down. They have no need to do so, as the trade demand is active enough to take away all they make as fast as it can be delivered. And Germany is still buying, though perhaps not so largely nor so eagerly as last month.

In spite of the drop in the warrant market there is plenty of business doing and the outlook is good, though not absolutely cloudless. Coal, for instance, is advancing and is already about 3 shillings per ton dearer than at this time last year, and dear coal and dear ore do not make for cheaper iron. The usual difference between ordinary foundry iron and hematite steel making iron is 10 shillings per ton, but latterly the difference has been nearly £1 per ton. Manufacturers are well employed and for finished material quotations are: Steel ship plates, £7 10s.; boiler plates, £8 10s.; steel angles, £7 15s.; iron angles, £7 15s., all with discount; steel rails, £6 12s. 6d., net.

Scotch Steel and Shipbuilding Trades.

A feature of the Scotch trade is that our steel makers are not much employed on home contracts. They are busy, but are working for the most part on export orders, and that is not an altogether satisfactory position. Some large inquiries have been coming from Canada and a good business is expected with the Dominion as soon as the St. Lawrence opens. The export business, however, will suffer when consumption on your side falls off and when Germany once more bustles into the foreign markets.

Our chief consuming industry—shipbuilding—is looking a great deal better than was expected. We had a record output in Scotland last year—658,830 tons of new shipping—but that was all in execution of building contracts booked in 1905 and in the early part of 1906. During the latter portion of 1906 few new contracts were booked, and it was supposed the shipyards would be slack after the turn of the year. But they carried forward a good deal of work from 1906, and in the month just closed the Scotch shipyards have turned out 28 new vessels of 35,900 tons, consisting to a large extent of cargo carrying "tramps," of which the world has a pretty full supply just now. New orders exceeded the launches in January, being about 48,000 tons, including two steamers of 350 ft. each, to be built by the Fairfield Shipbuilding & Engineering Company for the Canadian Pacific Railway Company's service on the Great Lakes. B. T.

The Armor Steel Foundry Company is the successor of the Matthews Electric Steel Company at Matthews, Ind., the plant of which was closed 19 months ago. A second electric crane and other new machinery will be put in. Chicago capitalists bought the plant.

The Chicago Pneumatic Tool Company.

The fifth annual report of this company, covering its operations for the year ending December 31, 1906, gives the following statement of profits:

Profits for the 12 months		$1,001,550.04
Less depreciation, including repairs and renewals	$128,081.46	
Less written off for developing new tools	21,999.97	
		150,081.43
Less bond interest	$115,000.00	
Less sinking fund installment	50,000.00	
		165,000.00
Less dividends, aggregating 4 per cent		224,351.32
Balance carried to surplus		$442,117.29

Surplus Account.

Surplus as at December 31, 1905	$536,292.15
Less appropriations on account of building of plant at Fraserburgh, Scotland, and to provide additional working capital for foreign subsidiary companies	100,000.00
	$436,292.15
Add surplus for 1906	442,117.29
Surplus carried forward	$878,409.44

The statement of assets and liabilities is:

Assets.

Real estate, buildings, plant, machinery, patents goodwill, less reserves	$6,442,988.46
Capital stock of other companies and other investments at cost	1,310,117.41
Treasury bonds	200,000.00
Treasury stock	37,000.00
Cash in bank and on hand and accounts and bills receivable, less reserves	1,189,059.95
Inventories of materials, finished work and work in process	1,050,569.49
Sinking fund investment	296,600.00
Total	$10,526,335.31

Liabilities.

Capital stock issued		$6,145,800.00
First mortgage bonds issued		2,500,000.00
Interest accrued on bonds payable January 1, 1907, and dividend payable January 25, 1907		119,116.83
Accounts and vouchers payable		330,936.68
Bills payable		247,499.94
Sinking fund for redemption of bonds		296,600.00
Reserve for taxes and suspense items		7,972.42
(Contingent liability on bills discounted, $140,687.79.)		
Surplus, balance of surplus	$436,292.15	
Add net balance of P. and L. account	442,117.29	
		878,409.44
Total		$10,526,335.31

President J. W. Duntley says: "In last year's report reference was made to the policy of the management in developing, broadening and extending the business of the company. The largely increased sales and profits realized, amounting to 11.237 per cent., available for dividends, would indicate that substantial results have been obtained.

"As stated in previous reports, this company acquired the Consolidated Pneumatic Tool Company, Limited, London, and since that time it has organized the Internationale Pressluft & Elektricitäts-Gesellschaft, Berlin, and has purchased the Canadian Pneumatic Tool Company, Limited, Montreal. All of these organizations show during the year increased volume of business and substantial gains in assets, with the result that this company has benefited in additional facilities for marketing its output with resulting increased profits.

"In connection with the acquirement of the business of the Philadelphia Pneumatic Tool Company, Philadelphia, and the organization and extension of the foreign companies mentioned above, it was thought desirable to borrow temporarily the sum of $195,000, which amount is included in the item bills payable, amounting to $247,499.94. The amount so borrowed has been more than offset by the additional assets acquired, and the profits resulting would appear to justify the wisdom of this course of action.

"Substantial additions to plants have been made during the year, and development work completed has exceeded that of the previous year, requiring a very considerable portion of time of the management and liberal expenditures. Of the authorized issue of $2,500,000 bonds, $200,000 are still in the treasury, and $293,000 have been retired for sinking fund purposes, leaving outstanding at this date $2,007,000. The excess current assets at December 31, 1906, $1,542,075.99, shows an increase of over $883,000 since your company was organized five years ago. In addition, large expenditures have been made during the year in providing additional plant capacity and, as stated previously, substantial amounts have been added to the assets of the foreign organizations."

A curious product mentioned in a consular report from Paris is called calcium steel, although it contains no steel or iron in any form. It is a ceramic product formed by baking a paste made of finely pulverized feldspar, sand and lime mixed in certain proportions. The product has remarkable qualities, being a porcelain or earthenware of great hardness and durability. It resists corrosion by acids, is a poor conductor of heat and electricity, and has a specific gravity of only 3.3. Although hard, the material is very tough, and can be machined like metals, being readily bored, cut, planed or polished. One of the uses for which it is expected to prove valuable is for pipes and conduits for water, gas and chemicals.

The resignations of George H. Schuler as vice-president and treasurer, and C. E. Buek, as a vice-president of the Southern Steel Company, have been presented, to take effect immediately. It is stated that this does not mean any change in the policy or administration of the company. Mr. Schuler has retired from business and Mr. Buek, who has been in ill health for some time, found it imperative to sever his business connections with the company on that account. President Moses Taylor of the Southern Steel Company states that it is probable that the vacancy made by Mr. Buek's resignation will not be filled, but a successor to Mr. Schuler will shortly be selected.

Charles M. Schwab, representing the Bethlehem Steel Company, has purchased the mines of the Boyertown Ore Company, near Pottstown, Pa., for a consideration said to be between $400,000 and $500,000. The rights obtained by the Bethlehem Company cover mineral privileges on 300 acres of land.

The Standard Steel Car Company, Pittsburgh, works at Butler, Pa., built 2836 steel cars in January, beating the best previous monthly record by nearly 500 cars.

On account of a rush of orders the Parrish-Alford Fence Company, Knightstown, Ind., has kept its plant running 22 hours a day.

A representative of the Sanitary Can Company, Fairport, N. Y., was recently in Indianapolis, examining the large buildings formerly used by the Standard Wheel Company. He said that it was the purpose of his company to establish a branch factory in Indianapolis and the wheel factory buildings would be used temporarily.

Union iron molders have had a bill introduced in the Indiana Legislature, now in session, providing for the establishment of lavatories, with hot and cold water and dressing rooms, in foundries casting iron, brass, steel or similar metals, the dressing rooms to have racks on which to dry the molders' clothing over night. It was stated by the molders that there are laws of the kind in Massachusetts, Rhode Island and Connecticut. The committee of the Legislature to which the bill was referred recommended that it be indefinitely postponed.

The city of Muncie, Ind., which with a cash bonus of $10,000 secured the Broderick & Quinlan boiler plant several months ago, and which is now one of the largest industries in the city, is raising another factory fund of $200,000, payable one-fifth at the time of subscription and one-fifth annually thereafter. It will be used to locate more factories in the city.

Zinc Ores Free of Duty.

Importers and smelters of zinc ores were sustained February 6 by the Board of United States General Appraisers in their contention for the admittance duty free of the carbonates and silicates of zinc, under the provision in the tariff for calamine, while the sulphide of zinc or blende is likewise held free under paragraph 614 as crude minerals. The board spent months in taking evidence and examining witnesses, and the official record in the case is one of the most voluminous in the history of that tribunal.

Last year the owners of the zinc ore mines in Missouri and other States persuaded the Treasury Department to levy a 20 per cent. duty on the ores under the paragraph in the law for metallic mineral substances. It was represented to the Government that ores were being brought into this country from Mexico, British Columbia and elsewhere at a low rate of duty, thereby competing in an injurious manner with the domestic product. On the other hand, the importing and smelting interests alleged an insufficient supply of the ore in the United States to keep the smelters in operation. The importers, therefore, requested that the ores be permitted to enter as in the past, paying duty at the rate of 1½ cents per pound on the lead actually contained in them.

The Treasury Department, decided, after consulting the Attorney General, to raise the duty to 20 per cent. Shipments entered by the Cockerill Zinc Company and the Lanyon Zinc Company were assessed with the heavy duty. These companies immediately filed formal protests with the Board of Appraisers, this action being taken to establish in a judicial way the proper classification of the ores under the law.

The ores figuring in the test litigation are typical of the importations of other smelters. Counsel, both for the Government and for the mine owners, state that an appeal will be taken at once to the United States Circuit Court.

Points in the Decision.

In his decision for the board sustaining the contentions of the importers and smelters General Appraiser Fischer says in part: "The questions that we have to consider are: 1. Does the term calamine, as used in paragraph 514 of the tariff, apply exclusively to the hydrous silicate of zinc, or does it cover both the silicates and both the carbonates of zinc? 2. Does the provision in paragraph 183 for 'metallic mineral substances in a crude state,' cover zinc ores, or do they fall within the terms of paragraph 614, as 'minerals, crude, or not advanced in value or condition by refining or grinding, or by other process of manufacture?' A third question that incidentally arises in the course of this controversy is whether it is legal to assess, under the provisions of paragraph 181, the duty on the lead contents of an ore that is dutiable also under paragraph 183, but as the conclusion that we have reached on the general issue makes it unnecessary to determine this point we shall not pass upon it. In respect to the first question the importers offered testimony to show that both the silicates and the carbonates of zinc are uniformly and generally recognized in the trade and commerce of this country as calamine. A number of witnesses on behalf of the Government refuted this claim and we are unable to find that there is any such uniform and general commercial understanding."

As in the many zinc ores found in nature the silicates and carbonates are commingled, that they are both of the same value and are used precisely for the same purpose, and that zinc ore is nowhere provided for by name, it is more than a conjecture, in the estimation of the Board of Appraisers, that Congress in legislating on the subject intended to cover by the provision for calamine both the carbonate and the silicate of zinc. Calamine has been mentioned by name in the free list in every tariff act since 1792, except in the tariffs of 1846 and 1857, where it was made dutiable, but at no time and in none of the many tariff acts passed by Congress, according to the lower customs tribunal, has zinc ore been provided for by name. From this omission the board draws the deduction that if any presumption arises at all from these circumstances it is that Congress intended no duty on zinc ore, as such, rather than that by changing the designation for "lapis calaminaris" to calamine, a change which first appeared in the act of 1846, it was intended to charge certain kinds of zinc ore with duty. In conclusion the decision says:

"As to the second question—namely, whether zinc ores should be classified under the provisions in paragraph 183, or under that paragraph 614, we are of opinion that the decision of the Circuit Court of Appeals for the Third Circuit in Hempstead *vs.* Thomas (122 Fed. Rep., 538) is decisive. It was there held that the provision in paragraph 183 applies only to that class of mineral substances in which metal appears in a free state, such as the ores of gold, silver and copper, and not to mineral substances in which metal *qua* metal does not occur. Zinc as metal does not appear in the ores here in question; they are silicates and carbonates of zinc, and under the rule cited they are not metallic mineral substances.

"It is urged that these ores are excluded from the provisions of paragraph 614 by reason of the fact that, as appears from the evidence, after being dug from the mine the large pieces were crushed by hand or machinery and the fragments that contained no zinc ore were thrown away. The object of this proceeding is to avoid paying freight charges on rock and dirt. It has been held that while any labor bestowed on an article is a process of manufacture, the mere removal of foreign matter from a product of nature, the elimination of rocks and dirt from zinc ores, for instance, would not operate to take such ore out of paragraph 614, for it is still crude ore, not refined, ground or manufactured. It is obvious that it is just as 'crude' for purposes of classification under paragraph 614 as it would be under paragraph 183.

"Our conclusion is that the carbonates and silicates of zinc are included within the meaning of the term 'calamine' as used in paragraph 514, and that they are free of duty under said paragraph and also under paragraph 614, and that the sulphide of zinc is free under the paragraph last named as crude minerals, &c., subject, however, to the qualification that when lead is found in these ores duty shall be taken on the amount of lead contained therein as described in paragraph 181. The decision of the collector in each case is modified accordingly."

At the annual meeting of the stockholders of the Pittsburgh Coal Company in Jersey City February 11 the retiring Board of Directors was re-elected, with the exception of Francis L. Robbins, who retired not only from the board, but also as chairman, as a result of a long contest for control of the company. William Flynn was elected a director in his place. J. C. Dysart was chosen a director to fill a vacancy. The Board of Directors met in February and elected as chairman of the board M. H. Taylor, the present president. The president's report showed that the year ended on December 31 last was the largest in tonnage production in the history of the company. Gross earnings increased 62.74 per cent. and the net earnings 250 per cent. The net earnings were $2,192,768, equal to 8.11 per cent. on the company's preferred stock.

At the national convention of the Fruit and Vegetable Packers' Association, which takes place at Buffalo, N. Y., this week, a notable exhibition of canning and packing machinery is to be made. Washing, snipping, paring and mixing machines of the latest and most improved designs for canning factories will be in operation at the Sixty-fifth Regiment Armory, where the exhibition is being held. About 2500 packers and canners from all sections of the country are in attendance at the convention.

In January the blast furnace of the Carnegie Steel Company at North Sharon, Pa., made 8568 gross tons of pig iron, the best previous monthly record having been 8459 tons. In one week in February the stack made 2127 tons, the best previous weekly record having been 2107 tons. The furnace was idle two days in January.

The Machinery Trade.

NEW YORK, February 13, 1907.

Increased activity was noticeable in the trade the past week, especially among the projects of magnitude, and not since the first of the year has so much come to light to indicate an increasing demand for machine tools. A few weeks ago business quieted down a little, which was only natural so early in the year, but now it is evident that trade has returned to its former great volume, with even a greater impetus given by the large inquiries received. These latter are from industrial companies, the railroads having not yet come into the market to any great extent, though specifications are being prepared by some of the systems and can be looked for at an early date. It is thought that conditions in the financial market are to some degree impeding the progress of improvements planned by the roads, but as soon as the financial market will take the securities of the roads at satisfactory prices it is probable that they will go ahead with improvement work that will necessitate the purchase of large quantities of mechanical equipment. One of the features of the market was the number of large inquiries received. That of the Standard Cast Iron Pipe and Foundry Company is probably the most important, as it covers tools aggregating over $100,000. A prominent pump manufacturer of this city has inquiries out for a fair sized lot of tools. In the West the Pullman Company has issued specifications for an extensive list of machinery, probably for installation in its new steel car shops. Several companies whose headquarters are in this city are figuring on the list, but aside from these the trade will not be materially benefited in this territory. The forerunner of machine tool purchases—new construction—is being more vigorously prosecuted in an endeavor to get increased capacity to cope with the extensive demand that exists for all classes of mechanical equipment.

It is noted in the trade that in some lines of machinery better delivery can be made to purchasers than was the case two months ago. Prices, however, keep up, and an illustration of the condition of the trade in that respect is manifested in the sale of the machinery equipment of an engine company located in a city about half way between New York and Philadelphia. Experienced machinery men appointed by a receiver in bankruptcy to put a price on the engine company's equipment appraised it at $9000, and when it was put up for sale a well-known machine tool house offered $27,000, while other bids were nearly as high. The appraisers estimated the machinery as second-hand equipment, and the result of the bidding was not a reflection on their judgment, but simply illustrated that there is a strong demand for second-hand equipment, and it was only another case where unexpected spirited bidding followed the offering for sale of equipment which two years ago would have been disposed of at a sacrifice.

Prospective Railroad Lists.

The engineers of the Delaware, Lackawanna & Western Railroad are preparing specifications for the machinery that will be purchased for equipping the new shops at Scranton, Pa., and it is likely that the lists of requirements will be sent to the trade shortly. The requirements for these shops will be of considerable magnitude, as the shop capacity in that city is to be doubled, the main building to be erected being 364 x 758 ft. A feature of the building will be the construction of two bays to be used as erecting shops, which will be equipped with 15-ton cranes. Plans also provide for a 130-ton traveling crane, as well as smaller hoisting and conveying apparatus. In addition to the large building there is to be a blacksmith shop, 127 x 300 ft. and a paint shop, pattern shop and pattern storage house, 50 x 300 ft. There will also be constructed a power house and several smaller buildings. All of the machinery is to be electrically driven, and a great deal of coal and ash handling machinery will be installed. The machinery which the company purchased about a month ago will be installed in the Kingsland shops, and we understand that when this machinery is installed the equipment of those shops will be completed.

The Seaboard Air Line will soon be in the market for the machine tools for its new shops at Jacksonville, Fla.

It is understood that the Canadian Pacific Railroad is to erect large shops at London, Ont., ground for which arrangements are now being made.

Owing to the impossibility of financing new improvements advantageously at this time the directors of the New York Central lines have decided to curtail expenditures for improvements to the road this year and limit the work to that which is only indispensable. There is a large amount of work already planned, which will in all probability be carried through this year, much of which cannot very well be held over, because contracts for part have already been placed and active work is in progress. These improvements include the construction of the Detroit River tunnel, the contract for the electric equipment of which is likely to be placed almost any day, and the improvements at the Grand Central Station, where plans have already been filed for a new power house, 88 x 104 ft. For this latter point a good sized list of power plant requirements has about been ready for some time and will likely be issued shortly. Improvements recently taken up include an extension of yards at Avis, Pa., where it is understood new shops will be built.

Plans are under way for the construction of a high speed trolley line between Watertown and other northern New York municipalities and the city of Oswego, and a committee of Watertown's representative financial men are organizing a company to build the road, the finances of which will be managed by Anson R. Flower, the New York banker. It is proposed to build about 75 miles of electric road, which will connect with the systems of the Lackawanna and the Ontario & Western railroads, and the latter company has agreed to make a traffic arrangement with the projectors of the electric line which will put Watertown in direct connection with New York and other important centers. The line will be an entirely independent one, according to the present plans, and besides a large amount of power equipment there will probably be needed machine and repair shop machinery, as it is proposed to make the road complete in every particular and not dependent on other interests.

Standard Cast Iron Pipe Company's Machinery Requirements.

The trade is busy figuring on the large list of machine tools for the new shops of the Standard Cast Iron Pipe & Foundry Company at Bristol, Pa., which have now been received by many of the machine tool houses in this city. This list covers tools amounting in value to considerably more than $100,000, which includes a number of traveling cranes whose approximate cost will be close to $60,000. The plant which the company is building will have a daily capacity of about 300 tons, and will be composed of four foundries, a large machine shop and many smaller buildings, constructed principally of steel and brick. The specifications for the machinery were sent out from Philadelphia, where the American Pipe Mfg. Company, which is largely interested in the new company, is located.

According to a statement made by Joseph H. Hoadley, president of the Alabama Consolidated Coal & Iron Company, who has offices at 175 Broadway, New York, plans have been made for the erection of a large locomotive plant to be erected at Gate City, a suburb of Birmingham, Ala. Mr. Hoadley, who organized the American Locomotive Company, is authority for the statement that parties with whom he is closely associated have completed financial arrangements, and he will have charge of the details. The corporation, to be known as the Alabama Locomotive Company, will shortly be formed, and it is said that a plant to cost at least $3,000,000 will be built, which, it is thought, will provide a manufactory large enough to turn out about 500 engines a year. Mr. Hoadley stated a few days ago that it is intended to have the plant built and in operation within three years, and this will necessitate active preparations at once. A number of engineers are already at work in Alabama surveying property owned by the Consolidated Coal & Iron Company, at Gate City, on which the plant will be built. Mr. Hoadley stated that it is proposed to build an electric line from Lewisburg to Gate City, belting Birmingham, which will be 6½ miles in length, and this will be used largely as a freight line to carry equipment and material for the locomotive plant. Another project in which Mr. Hoadley is said to be interested is that of the recently organized Birmingham Car & Mfg. Company, which has purchased 10 acres of property at North Birmingham for a plant to manufacture mine cars and car wheels. The company has an authorized capital of $100,000, with $50,000 paid in. The officers are: C. Ellic Foust, president; Eugene Fries, vice-president; T. A. Burbridge, secretary, and Glen C. Brown, treasurer. The company will have its central office at Birmingham, and is authorized by a charter to manufacture cars of all descriptions. Mr. Hoadley stated that the Alabama Consolidated Coal & Iron Company will also add to its plant by building two new furnaces, and the company will be in the market shortly, he stated, for 6000 hp. of blowing engines in connection with that improvement.

Large Plants to be Erected in New Jersey.

Extensive additions are to be made to the large plant of the Hall Signal Company at Garwood, N. J., and nearly $1,000,000 will be spent in constructing and equipping the improvements which will, it is announced, consist of practically a duplication of the company's present plant. The construction operations will be begun in the spring, and although plans have been made only in a preliminary way in addition to material extension to the company's power plant, much will be bought in the way of machine tools and other machinery equipment. The company now has a building about 100 x 300 ft. and employs about 300 hands. It

manufacturers railroad switch and signal equipment, and for the last year or more has been greatly behind in its orders. At the present time it has a large order from the Pennsylvania Railroad, and because of the extensive railroad improvements in the South and West, the demand for its products has exceeded expectations, with the result that the contemplated improvements are needed even now. The company has offices in the Broad Exchange Building, where some of its executive men have their headquarters. Just how much equipment will be needed for the proposed additions cannot be stated as yet. The announcement made in the newspapers that the company was intending to build a power house large enough to enter into competition with the Public Service Corporation of New Jersey in supplying light for nearby municipalities is denied by the Hall Company's officials, who say that all their resources are needed to get their plant in readiness to handle their own business.

A deal has been consummated between the United States Steel Corporation, through the Carnegie Steel Company and the Common Council of the city of Newark, N. J., whereby 13½ acres of land, located in the Waverly section of the city, have been transferred to the steel company. It will be remembered that an offer was made for the property some time ago, and preparations are already under way for the erection of a large warehouse for the steel corporation which will be used for storing structural material, sheets, plates and bars. A force of engineers has been installed in Newark, and they are now at work surveying and making preliminary plans for the building. It is proposed to erect a structure which will cost about $900,000, and the actual construction work will be begun by April 1 at the latest. It was stated by the company's representatives that a large force of men would be employed at the plant, and from that it is indicated that some fabricating will be done. It is expected that considerable power equipment and conveying machinery will be purchased for equipping the warehouse, and from all accounts no inquiries in the market at present are such as to indicate that the buying has been begun as yet. The land on which the plant is to be located abuts on the Pennsylvania Railroad, and it is understood that a branch will be built extending into the Steel Corporation's property.

Preliminary inquiries are out for equipment for a manufacturing plant to be built at Newark, N. J., on the Newark meadows, under the supervision of the F. H. Ogden Company, engineer, 15 Clinton street, Newark. Beyond the statement that about 200 hp. of engines and about 12 motors of from 6 to 40 hp. will be needed for the plant in the line of the power equipment, there is no information for the trade regarding the project, nor has the engineer authority to state for whom the plant is to be built. It is understood, however, that the plans include besides a power house, 40 x 80 ft., a one-story machine shop, buffing shop, plating and storeroom, 150 x 170 ft.; one-story foundry, 130 x 225 ft.; a building to be used for core ovens and a sorting room, one story in hight, 40 x 225 ft.; two-story office building, 30 x 40 ft.; pattern and storage building, two stories in hight, 40 x 125 ft., and a one-story japanning shop, 25 x 40 ft. It is thought that the Ogden Company will purchase the equipment when the details are worked out.

The Monarch Tool Company, 26 State street, Hartford, Conn., has purchased 50 acres of land at Succasunna, N. J., where it will erect a new plant, bids for the construction of which are now being received. The building will be 40 x 175 ft., two stories high, constructed of concrete, and will be situated on the tracks of the Delaware, Lackawanna & Western Railroad. The construction of the plant will involve an expenditure of about $15,000 and the building will be equipped with modern machinery for the manufacture of mechanics' fine tools, marine and stationary engines, builders' hardware and electrical appliances. The company also holds an option on a franchise for supplying electric light to Succasunna, Ledgewood and Kenvil. J. E. Allcott is president and F. Brink, secretary and treasurer.

Business Changes.

The W. P. Davis Machine Company, Rochester, N. Y., has moved its offices from 130 Mill street to 257 St. Paul street, at the west end of the New York Central passenger station. The company will carry a much larger stock of machine tools, engines, boilers, iron and wood working machinery, and mill supplies in its new quarters.

Owing to the large increase in its business in machine tools, the Brown & Zortman Machinery Company, Pittsburgh, will on April 1 remove its stock and offices from the present location in the Conestoga Building, Wood and Water streets, Pittsburgh, to 2525-2545 Liberty avenue, where its second-hand department is located. The Libert avenue building contains larger offices and about 22,000 ft. of floor space for storage purposes, which will permit the company to handle and show its new and second-hand machinery to much better advantage.

Catalogues Wanted.—F. B. Baugh, general superintendent of the Union Works of the Carnegie Steel Company, at Youngstown, Ohio, desires catalogues of machinery for rolling mills.

Chicago Machinery Market.

CHICAGO, ILL., February 12, 1907.

Unless happenings of a nature wholly unforeseen intervene to check the movement of expansion in industrial productive capacity throughout the country the story of the machinery market must continue to be one of monotonous prosperity. It is, however, a condition that in main is highly satisfactory to both manufacturers and consumers, although belated deliveries in many lines are still a source of more or less complaint. There have in the past week been numerous inquiries in the market for machinery covering a wide range of requirements, and the proportion of sales resulting therefrom has been large.

Pullman Company's Machinery Requirements.

The Pullman Company is in the market for a large list of tools and machinery, which are enumerated as follows: Two air receivers, 6 ft. diameter, 16 ft. long, complete with fittings and connections; 4 cross compound air compressors, Corliss type, 8000 ft. free air capacity per minute; 2 hydraulic pumps, 28 x 7½ x 18 in. cylinders, capacity each 400 gal. per minute; 2 hydraulic accumulators, 18-in. cylinders, 10 ft. stroke, with pressure gauges up to 2000 lb.; 2 lathes; 1 milling machine, No. 2; 1 press, 8 ft. wide, similar to S. G. No. 9; 1 power punching press, No. 35; 1 bench punching press, No. 100; 1 power gap shears, No. 836; 1 slitting shear, No. 307; 1 8-ft. brake for No. 16 gauge steel; 2 draw benches; 1 draw cut machine saw; 1 band saw for sheet steel; 1 swinging grinding machine; 1 gas furnace for tools; 3 gate shears, with 24-in. throat, to cut ⅞-in. plates, 100 in. long, at a stroke, motor driven; 3 gate shears, 24-in. throat, to cut ½-in. plate 100 in. long at a stroke, motor driven; 1 gate shear, 18-in. throat, to cut ⅝-in. plate 60 in. long, motor driven; 1 single shear, 25-in. throat, to cut 10 in. wide by 2½ in. thick, machine to have jib crane 1 ton capacity and 10 ft. reach, motor driven; 2 double angle shears on turnable, to shear 6 x 6 x 1 in. angles, motor driven; 2 single shears, 20-in. throat, to shear plates 16 in. wide by ⅝ in. thick, motor driven; 4 double shears, 25-in. throat, to shear flat bars 10 x 2 in., to be equipped with 2½-ton jib cranes, with 10-ft. reach on top of machine, motor driven; 2 hydraulic presses, with intensifiers, 1000 tons capacity with intensifier, cylinder pressure 350 tons, table 16 x 10 ft., with central vise ram 100 tons capacity and 4 ft. stroke; 2 hydraulic presses, with intensifiers, 880-ton pressure capacity, 350-ton cylinder pressure, table 14 ft. 2 in. by 9 ft. 6 in., with central vise ram 100-ton capacity, with 44-in. stroke; 2 hydraulic presses without intensifiers, 200-ton capacity, table 6 x 4 ft., stroke of ram 42 in.; 2 hydraulic presses without intensifiers, 200 tons capacity, table 4 x 3 ft., stroke of ram 36 in.; 4 gang punches, 100 in. between housings, to punch ⅝-in. plates and less, machine to have strength to punch either 30 13-16 in. or 16 15-16 in. holes at one stroke, motor driven; 4 single punches, 15-in. throat, with table for 4-in. and less angles, motor driven; 2 gag punches, 120 in. between housings, capacity 24 holes 13-16 in. through ½-in. plate, motor driven; 2 triple head punches, capacity of each head 9-in. hole through ½-in. plate, depth of throat 25 in., motor driven; 2 copying machines, 18-in. throat, for beams and channels from 6 to 24 in.; 4 horizontal punches, 8 to 10 in. throat, capacity ⅞-in. hole through ¾-in. plate, motor driven; 4 horizontal punches, 12 to 15 in. throat, capacity 1⅛-in. hole through 1-in. plate, motor driven; 4 horizontal punches, 12 to 15 in. throat, capacity 1 13-16-in. hole through 1⅛-in. plate, motor driven, with ½-ton jib crane, 10 ft. reach; 4 single punches, 25-in. throat, with 3 gag punches, capacity 13-15-in. hole through ¾-in. plate, motor driven, equipped with ½-ton jib crane, 10 ft. reach; 2 single punches, 25-in. throat, capacity 2¼-in. hole through 1¼-in. plate, motor driven; 3 double punches, 36-in. throat, with 3 gag punches, capacity 13-16-in. hole through ¾-in. plate, motor driven, equipped with two jib cranes, ½-ton capacity, 10 ft. reach; 8 single machines, 25-in. throat, with 3 gag punches, capacity 13-16-in. hole through ¾-in. plate, motor driven; 2 multiple punches, with automatic spacing table, to take plates 50 ft. long, 30 in. wide and ½ in. thick, with double row gag punches, capacity 8 holes, 15-16-in. hole through ½-in. plate, motor driven; 2 single punches, 48-in. throat, capacity 13-16-in. hole through ¾-in. plate, with 3 gag punches, motor driven, equipped with jib crane ½-ton capacity, 10 ft. reach; 2 single punches, 36-in. throat, capacity 13-16-in. hole through ¾-in. plate, with 3 gag punches, motor driven, equipped with jib crane ½-ton capacity, 10 ft. reach; 4 single punches, 15-in. throat, with 3 gag punches, capacity 13-16-in. hole through ¾-in. plate, motor driven; 12 hydraulic riveters, 120 in. gap, 24 in. reach, capacity 50 tons, complete, main line pressure 1000 lb. per square inch; 12 hydraulic riveters, 48 in. gap, 24 in. reach, capacity 50 tons, complete, main line pressure 1000 lb. per square inch; 30 hydraulic punch riveters, 24 in. reach, 6-in. stroke, capacity 50 tons, complete, with jib cranes, main line pressure 1000 lb. per square inch; 3 radial drill presses, 60-in. radius, motor driven; 12 portable

compression air riveters, with suspension yokes, 12 in. gap and 12 in. reach, capacity 50 tons; 2 drawbar yoke riveting machines; 125 No. 80 Boyer long stroke riveting hammers; 75 No. 3 Boyer air reamers; 1 No. 8 bulldozer, automatic clutch, motor driven; 1 steam drop hammer, stroke 42 in., 1500-lb. capacity.

The Atchison, Topeka & Santa Fe Railroad is preparing to spend a large sum of money to increase shop facilities at Chanute, Kan., and it is expected that as soon as weather conditions permit work on these improvements will be begun.

The Rock Island Tool Company, Rock Island, Ill., recently incorporated, will take over the business of the Jacobson Machine Mfg. Company, Warren, Pa., which will be transferred to the Rock Island plant. For temporary quarters, the Donaldson Saw Works Building, Twenty-fourth street, has been secured, but the company plans to build a new factory in the near future. It is now in the market for machine tools, together with complete equipment for the foundry and machine shop.

Following authorization for the increase of its capital stock from $25,000 to $100,000, the Burger Iron Company, Akron, Ohio, manufacturer of structural steel and iron work, has announced its purpose of erecting a new iron manufacturing plant in South Akron. Work on the new plant will be begun as soon as weather conditions permit. The company is now in the market for a steam engine, electric crane, generator, motors, heating apparatus, and the necessary machinery for fabricating structural material.

New England Machinery Market.

WORCESTER, MASS., February 12, 1907.

Milling machines have become more than ever a source of much complaint in the machinery market. Every one seems to want milling machines; the demand for them is probably greater correspondingly than for any other class of tool. The supply cannot increase greatly. The builders got hopelessly behind in their orders more than a year ago, and now, with deliveries going from bad to worse, 1908 machines only are available in most types and sizes. Occasionally the cancellation of some order gives the dealer the opportunity to put a few machines on the market, and they are greedily taken. The lack of milling machines is having an influence in holding back orders for other tools, where the one machine is necessary in order to balance a new equipment.

Orders are practically all for very small lots, but there are plenty of these sales, making the aggregate entirely satisfactory to the dealers. No large business is in sight, excepting the equipment of the new boiler shop at the Portsmouth Navy Yard, which is now being erected. The foundations were put in last season, and the building of the structure itself will soon be well along, so that it is presumed the authorities will not delay long in getting out their machine tool specifications. The list will not be a very large one, but it will run above $75,000 worth of machinery, probably. The contracts for the cranes have been decided.

The details of plans for the establishment of a Canadian branch of the business of the Billings & Spencer Company, Hartford, Conn., manufacturer of drop forgings, small tools and drop forging machinery, have been completed, and the work of building the new plant will be carried on immediately. The new company will be known as the Canadian Billings & Spencer Company, and its works will be located at Welland, Ont. Two buildings will be erected as the nucleus of the plant, each 60 x 100 ft. One of steel and corrugated iron construction will be devoted to the drop forging department; the other of brick and steel construction to the machine shop or tool department. The purchase of the equipment will be simultaneous with the beginning of the building, it is stated by the company. It is proposed to begin business in the fall with 10 drop hammers and 30 to 35 men, and to increase capacity as the demand for the products shall make it necessary. Hitherto Canadian manufacturers have been using malleable iron castings for many purposes for which drop forgings are desirable according to the practice in the United States, the reason being the high cost of the forgings. It is believed that the existence of a drop forging plant in the Dominion will have an important influence in substituting its product for malleable iron. Welland was selected as a site from a number of locations offered, each with material inducements in money or land. The town of Welland gives to the company 12 acres of desirable land, one frontage of which is on the Grand Trunk and Wabash railroads, while the Michigan Southern Railroad will build a track on the other frontage. Such railroad facilities, coupled with the proximity of the Welland Canal, now receiving important improvements, provide unusual means of handling freight. The company has closed a contract with the Ontario Power Company for up to 1000 hp. of electricity from the plant on the Canadian Niagara Falls. It is estimated that this power will cost about one-third as much as steam in this location. Natural gas is plentiful, costing 25 cents per 1000 ft., and will be employed by the company. The Canadian Billings & Spencer Company is chartered under the laws of the Dominion of Canada, with a capital stock of $200,000, of which $100,000 is 7 per cent. cumulative preferred stock, and the balance common stock. Frederick C. Billings, Hartford, is the president; W. H. Comstock, Brockville, Ont., vice-president; R. Bowie, Brockville, secretary-treasurer; J. Gill Gardner, Brockville, general manager, and these officers and John M. Gill, Brockville, constitute the Board of Directors. Mr. Gill is president of the Smart Mfg. Company, Brockville, and Mr. Gardner was until recently its manager. The company will have as neighbors in Welland several important manufacturing establishments, including Canadian branches of other American industries. Located there are the Canadian branch of the Plymouth Cordage Company, Canada Barcalo Company, manufacturer of metal bedsteads; Supreme Heating Company, manufacturer of heating apparatus; Canada Forge Company, Robertson Machinery Company, Ontario Wire & Steel Company, and M. Beatty & Son, art iron works.

The American & British Mfg. Company, Providence, R. I., is making preparations for the beginning of the erection of large additions to its works, already described in detail in this colume. Several large traveling cranes will have to be purchased immediately, and a part of the machine tool equipment, consisting of heavy machinery, will be bought in the near future. It is not, however, the intention to buy all the equipment at one time, the plan being to add machines from time to time as they may be required.

The city of Newton, Mass., is preparing to erect a new technical high school to cost approximately $250,000. The city of North Adams, Mass., is considering the establishment of a manual training school to cost $15,000.

The New York, New Haven & Hartford Railroad plans to establish a coaling station at Bridgeport, Conn., with a capacity of 1,000,000 tons a year.

The Hendey Machine Company, Torrington, Conn., manufacturer of machine tools, held its annual meeting February 6, when officers were elected for the year, several changes being necessary because of the death of Henry J. Hendey, president of the company. F. F. Fuessenich, who has been treasurer, was elected president and treasurer; C. H. Alvord, the secretary, was made vice-president and general manager, and F. N. McKenzie was chosen secretary. The directors are F. F. Fuessenich, C. H. Alvord, W. E. Fulton, T. S. Lewis and R. C. Swayze.

The Sanitary Waste Disposal Company, Boston, which will handle garbage for the city, is to erect a new plant, 77 x 104 ft., and three stories, with annex, 121 x 130 ft. The main building will be of reinforced concrete and steel, the annex of sheet iron. Arthur H. Pierson, 462 Atlantic avenue, is in charge of the plans.

A syndicate, headed by Charles Sumner Cook, Portsmouth, N. H., has purchased the power privilege and plant of the Androscoggin Pulp Company, Brunswick, Maine, and proposes to establish a hydraulic plant to develop 1500 hp.

Philadelphia Machinery Market.

PHILADELPHIA, PA., February 12, 1907.

While in some cases dealers as well as manufacturers closed a right fair volume of business the past week, others were not so well pleased with the result. Sales were somewhat irregular, and were closely confined to tools of the medium and lighter classes. While there have been some good specifications on the market but little business of any size has been placed, and that transacted recently was confined almost entirely to single tool propositions. Further specifications continue to come out in connection with the machine tool programme of the Baltimore & Ohio Railroad, and it said that there is more to follow. It is also reported that some of the Southern railroads are getting in shape to send out lists of their requirements for the year, but this is considered indefinite. Inquiries for small quantities and for single tools are quite numerous. The greater proportion of this demand is understood to be for equipment for replacement and for minor extensions. A good demand is anticipated in the former field, owing to the extreme strain to which many machine tools are subjected under the present day method of pushing them to their utmost limit of production.

The recently advanced prices seem to have but little effect on sales. No difficulty is experienced from this end if a satisfactory delivery can be made. The latter question is the most important in the consideration of a sale.

Manufacturers are fully occupied, and orders received about equal in most cases the productive capacity, so that practically no gain whatever is being made on general deliveries. In the greater number of instances further delays in shipment are encountered, owing to the inability to get prompt supplies of raw and semifinished materials entering into the construction of both machinery and tools.

There has been no further demand of any importance for export, especially for the standard line of machine tools.

Some business is pending, but it will probably be some time before it actually develops into orders. Special tools have been in better demand, and some orders have been placed. Those manufacturers transacting a more or less regular business abroad in machinery specialties report a fairly good volume of business coming in.

Some rather good business is under consideration in heavy engines and power equipment. New trolley systems as well as extensions to present lines and the central power plant proposition in industrial plants are good fields for this class of equipment at the time. The demand for such equipment in the medium horsepowers is somewhat better, but not as active as the trade would like. Boilers and engines in the smaller horsepowers are in poor demand, the gas and gasoline engine cutting into that business to a considerable extent. Second-hand boilers and engines are not very active, and reflect the general condition of the trade.

The market for second-hand machine tools is fully as active as for some months past. The extended delivery and the determination of some tool builders to refrain entirely from naming delivery dates, make the demand on the second-hand machinery field that much stronger. In many cases it is hard to supply tools desired, but dealers are covering the ground very thoroughly in their efforts to get tools to keep up their stocks, which in some instances are in fairly good shape.

Both iron and steel casting plants continue actively engaged. The difficulties in obtaining supplies of raw materials are as bad as ever, and further delays have been experienced recently in transportation. There is more difficulty experienced in obtaining prompt delivery of steel castings in any quantity than in gray iron castings, although in some instances gray iron foundries, particularly those working on high grade machinery castings, are well booked up. Consumers are still compelled in many cases to go outside the city, and are at that not always successful in getting much better shipment than at home.

L. C. Holmes, who until recently was connected with the selling forces of Manning, Maxwell & Moore, has accepted a position in a like capacity with the Vandyke-Churchill Company of New York and Philadelphia.

Plans have been filed by the Midvale Steel Company in the Bureau of Building Inspection for a 197 x 225 ft. one-story steel frame and corrugated iron addition to its armor plant at Nicetown. The building will be equipped with runways for a traveling crane.

Fels & Co., Seventy-third street and Woodland avenue, have begun the erection of a 30 x 40 ft. addition to their boiler house. The boiler equipment, consisting of two 350-hp. boilers, has been practically decided upon, but they are in the market for a steel stack; also for a 150-hp. Corliss engine to work under 115 lb. steam pressure.

Councils of the City of Philadelphia passed recently a loan bill for $13,500,000, which has the approval of the necessary municipal authorities. In the bill the completion of the filtration system, abolishment of grade crossings and the erection of bridges, wharf and other improvements are provided for.

Proposals will be received by the Department of Supplies, City of Philadelphia, until February 18, for supplies for 1907 in a number of departments, among which are included a steam driven air compressor, compression stand, indicators, shafting, pulleys and general machinery supplies, specifications regarding which can be had from the director, Robert Grier, room 312, City Hall.

Thirteen contracting firms submitted proposals to the Filtration Bureau of Philadelphia for the boiler equipment of the Lardner's Point Pumping Station No. 3. The department estimated the cost of the work at something over $106,000, but the bids offered are said to be considerably higher. There are eight boilers to be installed, together with economizers, heaters and other appurtenances, and those who submitted proposals were F. J. Boaz, M. & J. B. McHugh, Edward Fay & Son, Franklin Boiler Company, Maxim Boiler Company, Babcock & Wilcox, Edge Moor Iron Works, B. F. Sturtevant Company, J. H. Stitzer & Co., Atlas Engine Works, Heine Safety Boiler Company, Green Fuel Economizer Company and the E. Keeler Company. The bids were ordered scheduled, but no award has yet been made.

The Earle Gear & Machine Works has recently furnished one of its customers a large cast steel bevel gear having a 5-in. pitch and a 20-in. face. A large spur gear 95 in. in diameter was also recently completed and delivered. This concern is now equipped to cut gears ranging from 4 in. to 8 ft. in diameter, with practically any face. The special machinery department has recently completed a 12-ft. veneer cutting machine for a local concern and has an 8 x 105 ft. roller veneer dryer in course of construction for the same customer.

Dienelt & Eisenhardt, Incorporated, are very busy in all departments. A large oilcloth printing machine was recently delivered by this concern to the Blabon Oil Cloth Works of this city, and an order was taken for another for export to M. Navin, Limited, Kircaldy, Scotland. Orders for hydraulic jacks have been good, particularly those of 40 to 50 tons capacity, which are largely used by the railroad companies. There is also a good demand for dead stroke hammers, sales recently having been made of forging and smithing hammers, as well as for those to be used in copper work. The foundry is very busy on castings of all classes.

Government Purchases.

WASHINGTON, D. C., February 11, 1907.

The Bureau of Yards and Docks, Navy Department, Washington, will soon ask bids for a 1000-kw. generator, direct connected to either reciprocating engine or steam turbine, for the Portsmouth Navy Yard.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 19 for a pumping plant at the naval coal depot, California City Point, Cal.

The following bids were opened February 5 for supplies for the navy yards:

Bidder, 20, the Brooklyn Forge Company, Brooklyn, N. Y.; 22, Babcock & Wilcox Company, New York; 23, Blackall & Baldwin Company, New York; 28, Camden Iron Works, Camden, N. J.; 31, Cleveland Punch & Shear Works Company, Cleveland, Ohio; 35, Compressed Air Machinery Company, San Francisco, Cal.; 37, Chase Mfg. Company, Columbus, Ohio; 38, Craig Ridgway & Co., Coatsville, Pa.; 40, Continental Car & Equipment Company, New York; 45, Henry Disston & Sons, Philadelphia, Pa.; 63, G. & W. Mfg. Company, New York; 69, Garvin Machine Company, New York; 75, Henshaw, Buckley & Co., San Francisco, Cal.; 79, Handlan-Buck Mfg. Company, St. Louis, Mo.; 80, Harron, Rickard & McCone, San Francisco, Cal.; 82, Harrisburg Foundry & Machinery Company, Boston, Mass.; 83, Hyde Windlass Company, Bath, Maine; 87, A. L. Ide & Son, New York; 97, E. F. Keating, New York; 112, Manning, Maxwell & Moore, New York; 113, Montgomery & Co., New York; 114, Mosher Water Tube Boiler Company, New York; 116, Motley, Green & Co., New York; 133, Northern Engineering Works, Detroit, Mich; 134, National Electrical Supply Company, Washington; 137, Niles-Bement-Pond Company, New York; 139, Norton Company, Worcester, Mass.; 140, North Penn Iron Company, Philadelphia, Pa.; 143, J. Edward Ogden Company, New York; 150, Pratt & Whitney Company, Hartford, Conn.; 154, Prentiss Tool & Supply Company, New York; 164, Robbins Conveying Belt Company, New York; 165, H. A. Rogers Company, New York; 214, Vermilye & Power, New York; 219, Ernest Weiner Company, New York; 232, Woodward, Wight & Co., New Orleans, La.; 235, Watson-Stillman Company, New York; 241, Berry & Aikens, Philadelphia, Pa.; 242, Brown Hoisting Machinery Company, New York; 243, F. S. Banks & Co., New York; 245, Hill, Clark & Co., Boston; 247, Drew Machinery Agency, Manchester, N. H.

Schedule No. 325.

Class 1. One air hydraulic jib foundry crane—Bidder 38, $1800; 156, $1065; 235, $1650.

Schedule No. 326.

Class 11. Six marine straight water tube boilers—Bidder 22, $81,000; 114, $89,200, $93,700, $114,700 and $119,200.

Class 12. One heavy forge lathe—Bidder 75, $14,275 and $15,485; 137, $15,885 and $15,550.

Class 13. One cabinet turret lathe for brass work—Bidder 75, $625; 80, $637.35.

Class 14. One drill press—Bidder 35, $175; 75, $145; 80, $166.65 and $120.90.

Schedule No. 328.

Class 21. Six marine straight water tube boilers with superheaters and spare parts for the U. S. collier Vestal—Bidder 22, $72,990; 114, $84,700, $89,200, $92,600 and $100,700.

Class 22. One screw cutting lathe—Bidder 69, $635; 112, $680; 137, $675; 154, $722.

Class 23. One new model turret lathe—Bidder 150, $1092.50.

Class 24. One 800-lb. single stand steam hammer—Bidder 112, $1024; 137, $977; 154, $964; 245, $871.

Class 25. One bar straightening press—Bidder 12, $475; 247, $472.50.

Schedule No. 352.

Class 31. Twenty dump cars—Bidder 40, $3900; 63, $6629; 116, $4900; 219, $4080; 243, $4734.

Class 32. One three-motor electric traveling crane—Bidder 37, $2550; 133, $2350; 137, $2085; 140, $2175; 242, $2526.

Schedule No. 353.

Class 41. One portable conveyor belt—Bidder 164, $1850.

Class 42. One side crank steam engine—Bidder 82, $1360 and $1445; 87, $1858.

Schedule No. 354.

Class 51. Two horizontal steam steering engines—Bidder 75, a $7600, b $8000 and c $15,250; 83, a $6600, b $7000 and c $13,400.

Class 52. One radial drilling and countersinking machine—Bidder 31, $640 and $675; 112, $800.

Schedule No. 368.

Class 125. One Disston premier inserted tooth circular milling saw—Bidder 45, $207.

Class 135. One small single plunger pressure pump—Bidder 165, $90; 214, $89.90.

Schedule No. 370.

Class 171. One hand pipe cutting and threading machine—Bidder 79, $85; 97, $425; 112, $55; 113, $88; 154, $85; 214, $76; 241, $175.

Class 172. One centrifugal pumping set—Bidder 20, $1878; 23, $2841 and $2600; 28, $1825; 134, $1595; 140, $3100; 143, $1019.30; 232, $2050; 139, $2440.

The following awards have been made for machinery for the navy yards, bids for which were opened January 22:

The Niles-Bement-Pond Company, New York, class 153, one engine lathe, $405.

The Power Specialty Company, New York, class 229, eight superheaters, $3775.

Under opening of January 29 for hoisting engines for the Isthmian Canal Commission, the Lambert Hoisting Engine Company, Newark, N. J., has been awarded item 1, six double cylinder, double friction, drum hoisting engines, with boilers, complete, $5475; item 2, four double cylinder, double friction, drum hoisting engines, with boilers, complete, $6390.

The following awards have been made for supplies for the navy yards, bids for which were opened January 29:

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 31, one compound wound direct current generator, $1259.

The General Electric Company, Schenectady, N. Y., class 42, one electric motor, $1600.

Richard W. Geldart, New York, class 100, three stanchion pipe benders, $679.14.

Trade Publications.

Concrete Reinforcement.—General Fireproofing Company, Youngstown, Ohio. Circular and sample of "Trussit." Introduces this new style of reinforcing metal for fireproof cement construction. The important fact connected with it is that no wood form is necessary. Trussit is made in sheets 15½ x 96 in., and with a factor of safety of four will carry all ordinary roof loads on spans of 4 and 5 ft. The metal is split in herring bone pattern, and instead of being opened up in the usual way, relatively flat, is formed with hills and valleys by depressing the alternate backbones, giving it a corrugated cross section. It is particularly intended for mills and factories—for roofs, walls, partitions, linings of coal pockets and ash bins, &c. The circular also refers to other forms of reinforcing, including other styles of expanded metal, cold twisted lug bars, pin connected girder frames and herringbone expanded steel lathe.

Steam Heating Boilers.—Model Heating Company, 142 North Tenth street, Philadelphia, Pa. Circulars. One is entitled "Perfect Circulation in the Model Boiler," and points out the operating advantages of Model boilers. The other circular pertains to the vertical and horizontal forms of wall radiators, which are manufactured in four sizes.

Valves and Traps.—Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Pamphlet No. 7. Size 5 x 7½ in.; pages 47. Describes and illustrates the Anderson cushioned, combination cushioned and cushioned triple-acting nonreturn valves, made in angle and globe patterns; Anderson pressure reducing valves, balanced plug cocks, cushioned check and hand stop valves; the Golden Gate valves, National boiler blow-off, Anderson automatic and counterbalanced valves, standpipes, water columns, altitude valves and the Ideal strainer and fish traps. The Golden tilting steam trap and the Anderson automatic float valve are included; these were described in *The Iron Age* September 20 and October 4, 1906, respectively.

Niagara Power.—Cataract Power & Conduit Company, 718 Fidelity Building, Buffalo, N. Y. Booklet. Title, "Niagara Power." Contains numerous testimonials from users in Buffalo of the power generated by this company at Niagara. A long list of consumers is given, and also exterior and interior views of the power houses.

Woodworking Machinery.—Crescent Machine Company, Leetonia, Ohio. Catalogue. Gives general descriptions and specifications of the Crescent band saws of the 20, 26, 32, 36 and 38 in. sizes, and panel band saw, angle band saw, combination saw tables, universal saw tables, variety saws, jointers and accessories. The angle band saw was described in *The Iron Age* April 5, 1906, and the 32-in. Crescent improved band saw, January 24, 1907.

Electrical Apparatus.—General Electric Company, Schenectady, N. Y. Catalogues, bulletins, &c. Catalogue No. 9143, superseding No. 9132, deals with the type H transformers, and treats chiefly of their construction. Insulator type porcelain cut-outs are included and also tables of efficiencies, weights, &c., of the types H and HB oil transformers. Bulletin No. 4456 pertains to wrought copper cable terminals; No. 4457 to the parts of the form B arc headlights; No. 4459, superseding Nos. 4218, 4219 and 4346, to feeder regulators of the single-phase, induction and polyphase types; No. 4461, to the construction of the GE-78 railroad motor, giving closed and open views and schedule of speeds; No. 4460, to the parts of form 3 luminous direct constant current series inclosed arc lamps, with stationary upper electrodes; No. 4462 gives description and illustrations of variable speed direct current motors with commutating poles; No. 4463, superseding No. 4362, pertains to carrier bus arc panels for Brush arc generators; No. 4464, superseding No. 4406, relates to polyphase induction motors. Supply catalogue No. 7602 lists the parts of direct current automatic circuit breakers. An index to catalogue numbers is appended. Circular No. 3488 describes the method of packing Edison lamps, and gives reasons for ordering these lamps in standard package quantities. Price-list No. 5154 lists the Tantalum incandescent lamps and Tantalum units, and No. 5155, mercury arc rectifiers and rectifier tubes.

Pyrometers.—Charles Engelhard, 41 Cortlandt street, New York City. Pamphlet. Contains a brief illustrated description of the Le Chatelier pyrometer as made by the W. C. Hereaus Platinum Works, Germany. It is adapted to measuring temperatures between zero and 2900 degrees F., and is constructed in accordance with specifications of the Royal Physical Technical Institute, Charlottenburg, Germany. A large number of letters from users in various industries are included testifying to the satisfaction the instrument has given them, particularly with respect to its accuracy and reliability. A number of pages of useful information are appended, giving melting points of metals, furnace temperatures, effect of heat upon various bodies, melting and boiling points of various substances, &c.

Electric Hoists.—C. W. Hunt Company, West New Brighton, N. Y. Catalogue No. 067. Devoted to electric hoists designed to meet the requirements of coal yards, contractors, mines, railroads, steel works, &c. Illustrations are given of the open and inclosed geared hoists and various installations of them.

Electrical Apparatus.—Fort Wayne Electrical Works, Incorporated, Fort Wayne, Ind. Bulletins. No. 1082, superseding No. 1052, deals with the Wood multiple alternating current street arc lighting system. Tables of capacities and dimensions of arc lamps, transformers, pulleys, &c., are appended. No. 1083, superseding No. 1068, contains a detailed description of a new line of induction motors, known as types MA and M. Wiring diagrams are given for various connecting arrangements. No. 1084 pertains to the Wood standard switchboard panels for multiphase generators, and treats of the parts separately. No. 1085, superseding No. 1033, has to do with integrating switchboard wattmeters of the type K, form SAC. These are induction meters designed especially to register accurately on all loads regardless of the power factor of the circuit on which they operate.

Emery Wheels.—Patterson, Gottfried & Hunter, Limited, 146 Center street, New York City. Pamphlet. Calls attention to the fact that this company is the exclusive agent in its territory for the emery wheels of the Abrasive Material Company, and contains price-lists and dimensions in a tabular form of the regular wheels, emery cylinders and cup wheels, with some mention of the company's line of grinding and polishing machinery.

Concrete Blocks.—Modern Concrete Machine Company, 523½ Wabash avenue, Terre Haute, Ind. Catalogue. An illustrated description of the Modern concrete block machines, for which special advantages are claimed.

Nut, Bolt and Rivet Machinery.—Waterbury Farrel Foundry and Machine Company, Waterbury, Conn. Catalogue section A. Devoted to the company's several styles of headers, comprising open die single stroke, solid die single stroke, open die double stroke, solid die double stroke, as well as several sizes of three-blow and four-blow headers, and also screw threading machines, bolt trimmers and trimming presses, solid die reheaders, &c. Illustrations and specifications of these are included.

Steel Sheet Piling.—United States Steel Piling Company, Chicago, Ill. Catalogue. Illustrates and describes an interlocking steel sheet piling. Each pile is complete in itself and is interchangeable. It has rounded locking ribs and flat webs which present a uniform and free face for concreting. The cylindrical ribs are claimed to give the greatest strength and offer the least resistance in driving or withdrawing the piles. By the use of a wooden packing strip the piling can be made water tight.

Cranes.—Case Mfg. Company, Columbus, Ohio. Bulletin No. 32. Size 9 x 12 in.; pages 30. Shows by photographs the many improvements the company has made in electric cranes of recent manufacture, including standard and special cranes; bridge girders; trucks and drives; cages; direct and alternating current motors; standard, light service and low type trolleys; trolley frames; load and motor brakes; bottom blocks and limit switches.

Boilers.—A. D. Granger Company, 95 Liberty street, New York City. Bulletin No. 2, second edition. Size 6 x 9 in.; pages 27. Deals with Star safety water tube boilers for power, steam heating and hot water heating. Exterior and sectional views

of these are given, and photographs show various buildings where they have been installed.

Portable Crane and Hoist.—D. Round & Son, Cleveland, Ohio. Folder. Pertains to the Simplex portable crane and hoist, which is made in 11 sizes having capacities of from 1 to 3 tons, all operable by one man.

Electrical Apparatus.—Stanley-G. I. Electric Mfg. Company, Pittsfield, Mass. Bulletin and circular. Bulletin No. 615, superseding No. 254, deals with the G. I. flush receptacle and attaching plug, for which special advantages are claimed. List prices of these and also of face plates for flush receptacles are given. Circular No. 798 is devoted to alternating current motors for driving laundry machinery.

Graphite.—Joseph Dixon Crucible Company, Jersey City. N. J. Booklet. Size 6 x 9½ in.; pages 83. This is the tenth edition of "Graphite as a Lubricant." It treats somewhat of lubrication in general, but more exhaustively of graphite lubrication. The information included has been secured from scientific authorities, giving it practically the value of a textbook on the subject. All the good features of previous editions are retained and more of later knowledge is added. It is arranged and indexed so as to readily enable the reader to find the information he is most interested in.

Molding Machine.—Tabor Mfg. Company, Eighteenth and Hamilton streets, Philadelphia, Pa. Catalogue. Gives an illustrated description of the Tabor 24-in. hinged molding machine with 7-in. straight draft. Illustrations show the machine in various stages of performing work, and the descriptive matter deals with its construction and operation.

Disk Grinders.—Charles H. Besly & Co., 15 South Clinton street, Chicago, Ill. Catalogue. Deals with the Besly spiral disk grinders, band grinders, polishing machines, Helmet spiral circles, &c. Illustrations of machines and samples of their work are given, and also specifications, prices and testimonials. Taps, tap wrenches, die stocks, &c., are included.

Forges and Blowers.—Buffalo Forge Company, Buffalo, N. Y. Two leaflets. One relates to compressed air forges of the Nos. 20 C and 21 C types, one adapted for indoor and the other for outdoor use, and the second leaflet to the No. 200 geared hand blower, claimed to be powerful, easy running and durable.

Fire Brick.—John G. Stein & Co., Limited, Bonnybridge, Scotland. Catalogue. Size 6 x 10 in.; pages 40. Pertains to the Thistle fire bricks, the company's productive capacity of which is 100,000 bricks daily, and contains an extract from the *British Clayworker*, analyses of four kinds of fire bricks, miscellaneous weights and measures, and testimonials

Pipe Covering and Lagging.—H. W. Johns-Manville Company, 100 William street, New York City. Pamphlet. Gives short descriptions of the various kinds of asbestos and magnesia pipe covering and locomotive lagging manufactured by this company. Price-lists are included.

Engine Generator Units.—The B. F. Sturtevant Company, Boston, Mass. Two bulletins, Nos. 141 and 142. Describe recpectively vertical inclosed compound engines and generating sets using these engines. These sets, which were originally designed to fill the rigid specifications of the United States Navy Department, are built in a line of sizes ranging from 17½ to 100 kw.

Lathes.—New Haven Mfg. Company, New Haven, Conn. Souvenir. A decoration worth preserving is a "crystaloid" placque, showing a 36-in. swing engine lathe manufactured by this company. It also calls attention to other New Haven tools, including iron planers, slotters, upright drills, &c.

Industrial Railroads.—Arthur Koppel Company, 1601 Machesney Building, Pittsburgh, Pa. Folder. The center feature is a map of the United States covering the northeastern section as far west as Lincoln, Neb., and as far south as Columbia, S. C., on which are indicated the offices, works and yards of the Arthur Koppel Company. The border contains illustrations of the company's product, including tracks, turntables, switches, cars, locomotives, &c.

Conveying and Transmission.—Stephens-Adamson Mfg. Company, Aurora, Ill. Monthly periodical, *Conveying and Transmission*, Vol. 2, No. 1. This issue deals particularly with the company's line of sheaves, tension carriages, &c., as adapted for manila rope drive, and price-lists and various tables of information relating to wire rope are given. A particularly interesting article deals with transmission rope splices, explaining how to make them.

Arc Lamps.—Stanley-G. I. Electric Mfg. Company, Pittsfield, Mass. Circular No. 797. Pertains to A. E. G. "Brilliant" flame arc lamps of the direct current differential magnet and alternating current differential disk motor types, both being of the converging carbon construction. These are designed and adjusted to burn two in series on 110-volt circuits. All lamps are adjusted for 12 amperes and an arc voltage of 45.

Flexible Transmission.—Coates Clipper Mfg. Company, Worcester, Mass. Bulletin No. 20. Size 6 x 8¼ in.; pages 28. Deals with flexible transmission breast drills, drill presses, grinders, screw drivers, and the radial drills which were described in *The Iron Age* October 25, 1906, also lathe grinders, surface grinders, carborundum wheels, belting, couplings, &c.

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HARDWARE

THE granting of a general trademark, "Made in Ireland," intended to be applied to any manufactured product of the island, suggests the extension of a similar plan of advertising, which has already had its beginning in the United States. Long ago, when American manufacturers were struggling to get a foothold in trade they sometimes stamped their products as "Made in Birmingham," or in some other city whose manufacturers had a reputation won through years of successful production. This has so radically changed that certain European manufacturers have begun to label their goods "Made in the United States," for the same reason that once influenced the Americans.

There are great industrial centers in this country which have grown to be famous for the production of some certain line of product. Their manufacturers have striven to place honestly made and absolutely modern goods on the market. Generations of men, the son following the father, have had the specialty bred in their bone, this being true not only of the workmen, but of the manufacturers themselves, as a business has been handed down. It is easy to see how localized American trademarks, along the line of that which has been granted to the Irish manufacturers, could be utilized to advantage. To give a few examples, we could have "Made in New Britain" for Hardware; or, perhaps, it would be as well to have it "Made in Connecticut;" and "Made in Meriden," or, perhaps, "in Connecticut" for Silver Ware. "Made in Westfield" would count on a Whip label, and "Made in Norwich," or in Hartford, or in Springfield, on a Firearm. A Tap or Die would lose nothing by bearing the trademark, "Made in Greenfield," nor a bundle of Fine Wire products by the words, "Made in Worcester."

These are only a few instances in which the reputation of a city or town in association with some one general article of manufacture might work to the advantage of the manufacturer and indirectly through employees and their wages to the place itself. The scope of such a mark may be made more general. The machine tool trade knows what it is to have products "Made in the United States." We already have some applications of the general idea in which it has been carried out to advantage. The city of Bridgeport has well advertised the expression "Made in Bridgeport." Other places have been assisted through their chambers of commerce or boards of trade by the use of advertising pasters which manufacturers affix to their correspondence and to their goods. But it has seldom been done in a manner to become truly effective.

We are told that such words alone cannot constitute a trademark, but that they must be accompanied by some design. This could easily be arranged. A simple design, containing the suggestion of the product, could carry with it the necessary words. Once inaugurated, the scheme should be consistently maintained year after year, until the designating mark has become familiar to the eyes, even of those who cannot read the English language. Finally the harvest, accruing from persistency and perseverance, may be reaped in the results of thoroughly advertising what should be the insignia of honest goods.

Condition of Trade.

The volume of current business, already above the normal for this time of year, shows a distinct tendency to increase. Jobbers especially report themselves more than satisfied with the way goods are moving out so early in the season. Manufacturers and their agents, while they are taking few large contracts, state that daily orders from their customers to supply ordinary requirements are highly encouraging and justify an attitude of entire complacence regarding the spring demand. Some are actually running ahead of corresponding totals for last year, when the trade was buying heavily in anticipation of higher prices. A large distributer of imported as well as domestic lines advises us that he is starting out his salesmen from two to three weeks later than usual, because of the difficulty of handling business already booked and offering. He also mentions these significant facts as indicating the soundness and promise of the situation. Orders booked for shipment February 1 and March 1 have been ordered forward two to four weeks in advance of those dates. Larger orders for fall goods not usually expected before May or June are already beginning to come in. Belated shipments of goods short on last season's orders are being accepted and paid for by customers without question or complaint, while orders received for goods that have advanced are almost invariably confirmed when inquiry is made whether they will be accepted at the higher price. These facts indicate that merchants are doing and expect to do a large business; that their stocks are not in excess of their requirements, that they wish to take no chances of being without goods when they need them, and that they are not dismayed by the prices now prevailing. Winter weather of the old-fashioned sort is leading to great activity in season goods, especially in retail establishments. Instead of carrying over large stocks of these lines the trade may enter March with no more than the usual remnant of winter stock. Under existing conditions manufacturing costs are gradually advancing, and this increased cost is reflected in the announcement of higher prices from time to time in many minor lines and specialties. Manufacturers, however, are endeavoring to avoid advances which it may not be feasible to maintain. Many factories are suffering inconvenience from difficulty in obtaining raw material, a condition which results from the inability of the mills to respond promptly to the demands made upon them, and also from delays in transportation, as the railroads are unable to handle properly the great quantities of freight committed to them.

Chicago.

Retail Hardware merchants' associations in many States throughout the Middle West are occupying the attention of retail merchants, and the lull occasioned by protracted cold weather and heavy snowstorms, resulting in almost complete cessation of outside building operations in the territory affected, was not unwelcome to either the retail or jobbing trade. It is highly significant of the prosperous trend of affairs, that in the discussions heard at these gatherings no note of complaint of dull trade or apprehensiveness as to the future is sounded. In the line of Builders' Hardware there is still a strong demand for inside finishing goods, which has not been affected by weather conditions. Advances hitherto made on these lines have not, it is claimed, been commensurate with those on other building material, and illustrative of

this fact it is stated that whereas the finishing Hardware for a building formerly constituted 1¾ to 2 per cent. of the entire estimate, it now rarely exceeds 1½ per cent. of the cost. Altogether the conditions surrounding trade and the assurances of a still heavier business in the coming spring months are highly satisfactory.

NOTES ON PRICES.

Wire Nails.—Demand in the form of specifications on contract orders is heavy, and greatly exceeds new business. Prompt shipments are being especially urged by customers at Southern points, owing to earlier requirements. Derangement of transportation facilities, resulting from snow and cold weather, has further delayed deliveries of Nails. The market is firm and steady. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....$2.00
Carload lots, to retail merchants..... 2.05

New York.—A moderate demand characterizes the local market, which is considered satisfactory for the season. New York quotations are: To retailers, carloads, on dock, $2.19; less than carloads, on dock, $2.33; small lots, at store, $2.30.

Chicago.—Orders from all sections are plentiful, but on account of the early needs in the South and Southwest the pressing demand for present shipment is becoming more pronounced. Mills are not able under present conditions to accumulate stock, and with the increase that will come a little later from Northern territories more delay in shipment will certainly result. Prices remain unchanged, and are as follows: $2.15 in car lots to jobbers, and $2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Demand for Wire Nails continues fairly large and is showing strong signs of growing materially heavier, as the spring trade is opening up and promises to be very large. The Wire Nail mills expect an enormous volume of business in the next three or four months, commencing with March, and have not been able to catch up on deliveries, owing to shortage of cars and heavy demand. It is claimed that high prices of Steel, heavy demand and other conditions warrant another advance in prices, but whether this will be made cannot be stated definitely at this time. It can be stated, however, that at least one leading mill is quoting $2.10 for forward delivery and is securing some business at this price. The market is very firm and if a change occurs it will be an advance. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....$2.00
Carload lots, to retail merchants..... 2.05

Cut Nails.—Mills are still behind in deliveries and at least one has been obliged to close down because it has been impossible to get deliveries of Steel which has been contracted for. It may be necessary for the mills to advance wages of workmen, so that some mills that have Nails to dispose of are asking $2.10 to $2.15, base, Pittsburgh. The regular meeting of the Cut Nail Association is scheduled to be held on the 26th of this month. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.05; less than carloads, to jobbers, $2.10; less than carloads, to retailers, $2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—The demand is somewhat less than for Wire Nails, which is not an unusual condition at this season. Jobbers' quotations are on the basis of $2.30 for small lots at store.

Pittsburgh.—The mills are still sold up, some concerns refusing to take orders for Cut Nails for delivery prior to April. Stocks held by jobbers and also by the mills are light, especially on certain sizes. The market is extremely firm and should an advance be made in Wire Nails it will be immediately followed by one in Cut Nails. Prices are very firm, quotations being as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $2.05; less than carloads, to jobbers, $2.10; less than carloads, to retailers, $2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—While mills are considerably behind on deliveries, buyers are insisting upon prompt shipments on specifications. New business is being accepted by some mills only at premiums over regular quotations. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Chicago.—A fair amount of new business is reported, which is steadily growing as the season advances. In some parts of the country goods ordered 60 days ago are now badly needed, and the buyers are importuning for shipments. Quotations are as follows: Jobbers, Chicago, car lots, Painted, $2.30; Galvanized, $2.60; to retailers, car lots, Painted, $2.35; Galvanized, $2.65; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, Bright, in car lots, $2.25; Galvanized, $2.25, car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—A fair amount of new business is being entered, while consumers are specifying very liberally on contracts placed prior to the last advance in prices. Spring trade will soon open up and jobbers are urging the mills to make as prompt shipments as possible in order that they may have large stocks to meet heavy expected orders. One or two leading mills are asking premiums of $2 a ton over official prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.15	$2.45
Retailers, carload lots	2.20	2.50
Retailers, less than carload lots	2.30	2.60

Smooth Fence Wire.—Demand is increasing and at the same time specifications on contracts are coming in freely. The mills are still much behind on deliveries and some are asking premiums over regular quotations for forward deliveries. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads $1.85
Retailers, carloads 1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Fence manufacturers, who are now in full activity to provide for the early spring trade, are ordering freely. The volume of business being received is large, and the mills are more concerned with the problem of satisfying their customers on deliveries than in looking for new business. Quotations are unchanged as follows: In car lots, to jobbers, $2, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—The mills have a very heavy tonnage on their books in contracts, on which buyers are specifying liberally. Spring trade will soon open up, when demand is expected to be very heavy, the mills looking for an enormous volume of business this year. Prices are very firm, one or two mills asking premiums of about $2 a ton over official prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads $1.85
Retailers, carloads 1.90

The foregoing prices are for base numbers, 6 to 9.

Axes.—The Axe market for the year opened on a low basis, considering present manufacturing costs, and it is stated that contracts have been booked with most of the larger buyers at figures which represent little profit to the producers. This condition of affairs results from excessive competition between manufacturers which has prevailed since the dissolution of the old pool about a year ago. Last season, buyers took advantage of the sit-

uation to purchase heavily when the market opened, and prices subsequently showed an advancing tendency. It is believed that things will go about the same way this year, and some makers are already asking a premium over the prices at which they have booked the majority of their contracts. There is reason to believe that they are holding back some proportion of their output with a view to averaging up their selling price on orders taken later in the season.

Brass Butts.—Further advances in metal have led to a change in the price of Wrought Brass Butts which have moved up from a base discount of 50 to one of 45 per cent. Beyond this there are moderate concessions to jobbers and other quantity buyers. These discounts, it should be borne in mind, are quoted on the new list adopted a few months ago, which is double the list previously in force.

Sturges & Burn Mfg. Company.—Owing to the increased cost of raw material, Sturges & Burn Mfg. Company, Chicago, has recently made a 10 per cent. advance in its well-known line of Milk Cans.

Window Glass.—Two events of interest during the week are the decision of the National Brokerage Company to deal direct with the small trade, at least in the West, and the settlement of the difficulties with the Glass Workers' Union. A meeting of the Western jobbers was held in Chicago, at which representatives of the Brokerage Company were present. The jobbers, according to report, were given an opportunity to place a large bulk order, which they did not feel justified in doing at present, and the manufacturers announced that they would be obliged to dispose of Glass in some other way. It is reported that in the settlement of the difficulty with the workers' union it was agreed by the workers to support the movement of closing down all hand operated plants, including the independent factories, at such a time as sufficient Glass had been accumulated by the manufacturers to supply demand until the time of starting the factories in the fall. Demand is light at the present time, as usual at this season, but indications for future business are regarded as encouraging by manufacturers. Quotations for carload lots are as follows: Single strength, 90 per cent.; double strength, 90 and 5 per cent. discount from manufacturers' list. Local demand is light and jobbers' quotations, from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount for all sizes, single and double strength; outside of Greater New York, 90 and 5 for single and 90 and 10 per cent. discount for double strength Glass.

Binder Twine.—The announcement of prices by the International Harvester Company has not resulted in a marked increase in buying. It has, however, improved the situation in so far as a general announcement of prices by manufacturers has followed. It is understood that some manufacturers are guaranteeing prices. Demand is moderate, averaging probably about the same volume of business as for a corresponding period in former years. Quotations by different manufacturers vary slightly on some grades of Twine, but the following prices fairly represent the market, Chicago delivery, with ¼ cent less in carload lots:

	Cents per pound.
Sisal	9½ to 9⅝
Standard	9½ to 9⅝
Standard Manila	10¾
Manila (600 ft.)	12¼
Pure Manila	13¾ to 14

Rope.—Orders are for moderate rather than for large quantities, while for the season demand is considered fairly good. Prices remain unchanged and are generally being adhered to. Quotations are as follows: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents; Pure Sisal, 9¼ cents; No. 2 quality, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Linseed Oil.—The strong position of Seed lends strength to the Oil market and is regarded as warranting an advance in the price of Oil. Higher prices would doubtless rule if the demand for Oil was active, whereas it is confined to small lots, as far as new business is concerned. Specifications on contract orders are being received by crushers in good volume, but lack of transportation facilities is interfering with prompt deliveries. New York quotations for jobbing lots are as follows, according to quantity: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 40 to 41 cents per gallon. Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—Owing to snow and cold local demand has fallen off to such an extent that stocks in yard have accumulated, and prices have declined in consequence. Advices from Southern points are to the effect that owing to cold weather receipts have been light, with higher prices looked for. New York quotations are as follows, according to quantity: Oil Barrels, 73½ to 74 cents; Machine Made Barrels, 74 to 74½ cents per gallon.

Sheet Copper.—Manufacturers of Sheet Copper on February 7 advanced the base price 2 cents per pound, making it now 32 cents, base, the market for it keeping firm and strong.

Tom Plowman's Predicament.

BY W. W. PATON, DICKEY, N. D.

Tom Plowman lived on a section farm,
And not far from town was it either,
He sang as he wielded his sturdy arm,
An easy task was it neither,
For whether 'twas springtime, summer or fall,
He had to contrive the suport of them all—
Those at home, in town and Chicago.

Well, Tom made some money and got along well,
And was thought of quite highly for certain,
So may it have lasted, for all we can tell,
If Tom hadn't wanted a curtain.
He asked the price from the merchant in town,
Compared it with Sawbuck's, and then with a frown,
He started to deal in Chicago.

He soon told his neighbors, and they—just as wise,
Sent away for whatever they wanted,
They all cared for nothing except for the price—
Their home merchant looked poor and haunted,
Till one day he failed, and they bought up his store
To use it for stables and maybe some more,
Now the storekeeper works in Chicago.

Tom got along pretty well for a fact,
Till his stock strayed away in a blizzard,
He wanted to advertise, for he had tact,
But the editor—he was no wizard—
When the storekeeper busted he could not stay,
So he packed up his plant and moved far away—
It is thought that he went to Chicago.

So Tom froze his feet when he hunted his stock,
And the doctor had left for climes warmer,
The trains did not stop at the siding—a shock
It sure must have been to the farmer.
Now Plowman the catalogue studies in vain
To find a town, paper, a doctor or train
That will stop any place but Chicago.

H. F. BRAMMER MFG. COMPANY, Davenport, Iowa, manufacturer of Family Washing Machines, has recently acquired, under a royalty basis, the exclusive right for the manufacture and sale of the entire line of Washing Machines heretofore placed on the market by the Benbow-Brammer Mfg. Company of St. Louis and Davenport. With these Machines added to those of the H. F. Brammer Mfg. Company, its line now comprises 15 different styles of Rotary and Lever Washers. The company states that new types of Machines will shortly be added.

A RECENT ISSUE of the *Greenfield Republican*, Greenfield, Ohio, contains an interesting sketch of the business career of J. A. Harps, of the J. A. Harps Mfg. Company of that city. This company has heretofore been manufacturing the Never Fail Kerosene and Gasoline Cans on a royalty basis, but in December last Mr. Harps purchased all right, title, and interest of the original patentee. With this untrammeled ownership Mr. Harps has planned to make important enlargements in both factory and equipment.

ARTHUR H. BREUNIG has purchased the store of H. J. Breunig, Humphrey, Neb., and will carry a line of Shelf and Heavy Hardware, Stoves, Tinware and Harness.

Method of Introducing a Hardware Side Line.

BY H. A. JOHNSON.

In these strenuous times, when so much energy and enterprise is required for the successful conduct of the Hardware business, live merchants are often on the lookout for side lines which may advantageously be taken up in connection with the general Hardware line. The following article describes in detail how a well-known advertising specialist handled the matter as based on a recent experience in which he conducted the campaign for the merchant. The Paint line as the subject is especially opportune, in view of the satisfaction and profit with which many merchants have added this department to their business during the past few years.

I DO not know that I can do better than to take a concrete illustration, a typical case on which example I worked in the fall of last year. The following illustration embodies all the points—usual and unusual—that come up. The present case, too, is that of a Paint line, the advantages of adding which *The Iron Age* has consistently argued, and I am glad of this opportunity to prove many of the theories you have advanced tending to show that Paint is a clean and profitable line to handle and one not hard to exploit in an advertising way.

Preliminary Survey.

Upon being advised by my clients that they contemplated putting in a line of Paint I was requested to suggest plans and methods covering its introduction in all ways. In my preliminary survey of the entire situation I took into consideration the time of the year that was best suited to the subject of Paint, and I argued that while summer was the ideal time to use Paint, it was not necessarily the best time to introduce the subject. Human nature makes its plans and when ready to act follows beaten paths. Therefore the public mind needed to be disillusioned somewhat. Never before had a Hardware store in that town sold Paint. Heretofore the Paint trade had been in the hands of druggists, decorating establishments and regular Paint stores.

Thus I reasoned I would need to inaugurate a campaign of education to rid people of old notions as to who sold Paint. In fact, not so much to rid them of old notions as to burn into their minds the fact that Paint could be bought in another place. I also reasoned that when the fall sets in people have to stay indoors, and it is then that floors and trim are painted, curtains put up and homes made tidy generally. (That applies more particularly to city homes.) Last, but not least, I felt sure the country people—who once they use it, use lots of Paint—did their painting after crops were sold. Their money once in hand they would get ready for winter and their ideas would be centered on getting things snug and dry, and the fall, then, would be the ideal time to hammer a Paint proposition at them.

If the truth be told, I cared more about the country trade than I did about the city trade, because people in the country not only use more Paint, but, more important fact, there are fewer "renters." Preserving property means a vital something to the man who owns it. To the renter it means nothing—as a rule.

All told, my reflections resulted in the conviction that the best time to bring out the new line was in the fall. That determined, the plans for advertising were laid as are hereinafter set forth.

Using the County Fair.

Even before the Paint was in my clients' store I learned that the county fair was but a fortnight off, so I immediately urged that space in the exhibition hall be secured. This was done, and a telegram sent off to the Paint people telling them a big exhibit was planned for the fair and requesting them to send their exhibition demonstrator to take charge of it. He came forthwith, took full charge of the matter, trimmed the space attractively, so shelving it as to display the cans to good advantage, each size of can by itself, and arranging it all in a way that gave the impression of there being far more Paint in the space than was actually the case. Among other things, he arranged to have on hand a quantity of boards of various sizes for purposes of practical demonstration.

The week preceding the opening of the fair I saw to it that all the city and county newspapers had an announcement to the following effect in a 5-in. single column space, and during the progress of the fair this was printed on cards and distributed from hand to hand on the grounds:

YOU
ARE
CORDIALLY
INVITED
TO
VISIT
OUR
BOOTH
AT
THE
COUNTY
FAIR.
WE
WILL
SERVE
LIQUID
REFRESHMENT
FREE
OF
CHARGE.

I was born and reared in the country, so I knew county fair traits well enough to know that all who attend them are looking for souvenirs; in fact, something for nothing. I knew if we advertised something free we would not lack audiences. And my deductions proved true. Naturally, many who came to our booth expected something to eat or to drink. Alas! Paint was good for neither purpose. I had promised "liquid refreshment." Was not Paint a refreshment? We heard of no annoyance over the term. The majority of people saw the demonstration and asked for color cards. Small sample tins were given out free.

Orders, Actual Orders Were Booked

that more than covered the cost of the exhibition. We took the names and addresses of all the onlookers that we could get. I shall show presently what we did with these names.

After the fair was over the following advertisement was inserted in local and county papers:

The Liquid Refreshment

that we "served" at the fair occasioned no end of comment. Many thought they were going to get something to eat and we were sorry to disappoint them; many others saw the point and came to know what good refreshment our new line of paint is. Stop to think—paint is refreshment—now, isn't it? This is about the last chance you can have to get your house, fence or property in proper condition to withstand the elemental rigors of winter. When water gets into wood it means rot and rot means that your property decreases in efficiency, strength, looks and value. So paint seems to be just plain horse sense. For property indoors, such as floors, trim, etc., we have ———, an elastic, transparent, durable varnish that even heels cannot mar. That sounds like an extravagant claim, but let us prove it and so "show you."

A Personal Letter.

The names and addresses taken at the Fair were next carefully transferred to a card and the following letter was sent to every name in the file:

MR. JOHN HANSON, Pleasant Plains, Ind.

DEAR SIR.—We were sorry you could not spare more time while you were in town for the Fair. We should like to have shown you even more of the good points of —— Paints. But you were good enough to give us your name, so we will explain it more fully by letter.

There was a time, Mr. Hanson, when Paint was just White Lead and coloring matter, with just enough Oil to make it run freely and smoothly. But times have changed, and to-day the Paint manufacturer has to go into the chemistry of it, as he has also to go into the chemistry of wood and the changes that the weather brings about in and on it. The good doctor does more than merely bandage a wound. He cleans and antisepticizes it first, before he even thinks of covering it with a bandage. Just so the modern Paint maker. The latter *must* be as thorough.

—— Paint penetrates the pores of the wood. More than simply closing the vent, it solidly fills the pores and worm holes. When —— Paint sets the surface of the painted wood is genuinely poreless. This means that snow and rain can no more injure the wood after it is coated with —— Paint than they can harm Glass.

We have gone into the subject thus because we know you are interested, because we know you are alive to the difference between good and poor paint, because we know you have buildings on your place that need painting, because we hope to sell you a bill of Paint.

That's why we are inclosing a color-card and price-list, showing all discounts. Note the quantity discount. If you can get your neighbors to buy their Paint when and where you buy yours, no matter what colors they want, you can all get an extra discount. Should you need Putty or Glass we will buy it for you and ship it with the Paint. Brushes we keep in stock. Hardware, too.

Of course we will ship by freight to ——, which will be a much shorter drive for you than were you to come clear into the city here. Oh, yes, we will pay the freight charges. Your order only can mean a small profit to us. But it'll mean to you the trebling of life and value of every square inch of wood surface that you use it on.

Do we get it?

Very truly yours, &c.

One other follow-up goes out a week after the above, containing a cleverly executed carbon copy of the first letter, along with an urgent bit of salesmanship. The letters are doing good work.

Street Car Cards.

Realizing that "he who runs may read," I also planned that he who rode might read as well, the topic being ———— Paints. So in the street cars of the city were cards of which the following are typical, the display lines being in red, and the text in black ink:

PAINT—A SERMONETTE.

Paint is physical insurance. It prevents decay. Property that isn't painted soon deteriorates. The wood decays and its value shrinks. But the wise man uses paint, keeps the wood-pores closed and his property increases in value.

ARE YOU OF THE WISE MAN'S CLASS?

If not, you can join it by getting your paint of ———— ————

JOHNNIE'S "ESSAY" ON PAINT.

"Paint is used by men and women. Some use it on the house, others put paint on their faces. My Ma says the woman next door paints. Her nose is nice and red. (Not Ma's nose). I painted something the other day. He was a dog. He ain't a dog no more, He's dead."

WE DON'T KEEP PAINT—WE SELL IT!

The "essay" attracted a good deal of attention, and therefore developed comment, which proves that in street car advertising an ounce of pleasing is worth a good many pounds of instruction. It likewise sold Paint and since that is what it was designed to do, it may truthfully be said to have accomplished its purpose.

Keeping It Up.

We have been keeping it up all fall long, striking while the iron was hot, and going after city folks who might have interior woodwork that needed retouching, or outbuildings, fences, &c., that Paint might improve. In the meantime we have had a man working on the owners of property, particularly new houses nearing completion. The owner might employ whom he chose to apply the Paint. All we wanted was to sell it. We will work that selling plan next year, too, when there is more building going on. It looks good to us.

Pleasing Thoughts.

The opening stock of Paint cost about $350, on 90 days' time. It was in stock hardly a month before a good big hole had been made in it. One color, in popular size cans, was gone. And I think that by the time the bill became payable my clients were very willing to meet it. A bill that is willingly met is one that has pleasing thoughts connected with it. And pleasing thoughts nowadays are *profits*.

TRADE ITEMS.

C. M. HURST, president of the Morehouse-Wells Company, Decatur, Ill., was tendered a complimentary dinner on the evening of February 12, at the Chicago Athletic Club, by members of the Illinois Retail Hardware Dealers' Association, and as a token of their esteem he was presented with a magnificent Masonic charm. Those present were W. T. Gormley, J. H. Gormley, W. H. Bennett, C. M. Hurst, G. R. Lott, D. A. Merriman, D. B. Gann, R. R. Elliott, L. D. Ray, Palmer W. Holmes, J. B. Chandler, W. C. Cutler, W. L. Sanford, Geo. T. Bailey, A. A. Ainsworth and Daniel Stern.

THE JAMES WALKER HARDWARE COMPANY, Montreal, Quebec, has changed its organization somewhat. A profit-sharing arrangement has been adopted for the benefit of a number of employees who have served the company loyally. For a year past it has been the desire of the Messrs. Walker to reorganize the company, and this was finally done with the first of this year. The reorganization took place on the following basis: Jas. Walker, president; David S. Walker, vice-president; H. Holden, secretary-treasurer; F. Max Hill, manager. The Board of Directors consists of these gentlemen and H. Frigeon, H. C. Malone, H. J. Bastien, Ed. Douglas. Those named outside of the president, vice-president, and manager were permitted to subscribe for a certain amount of stock on very advantageous terms. Seven other employees who have been associated with the company for a number of years and have given faithful and efficient service are to have the benefit of a profit sharing basis. In other words, a certain amount has been set aside the earning of which is to be distributed to the seven employees mentioned. The company's business, which has had a steady growth, was established 50 years ago by James Walker, senior, who retired in 1883, being succeeded by his sons, who are still identified with the company.

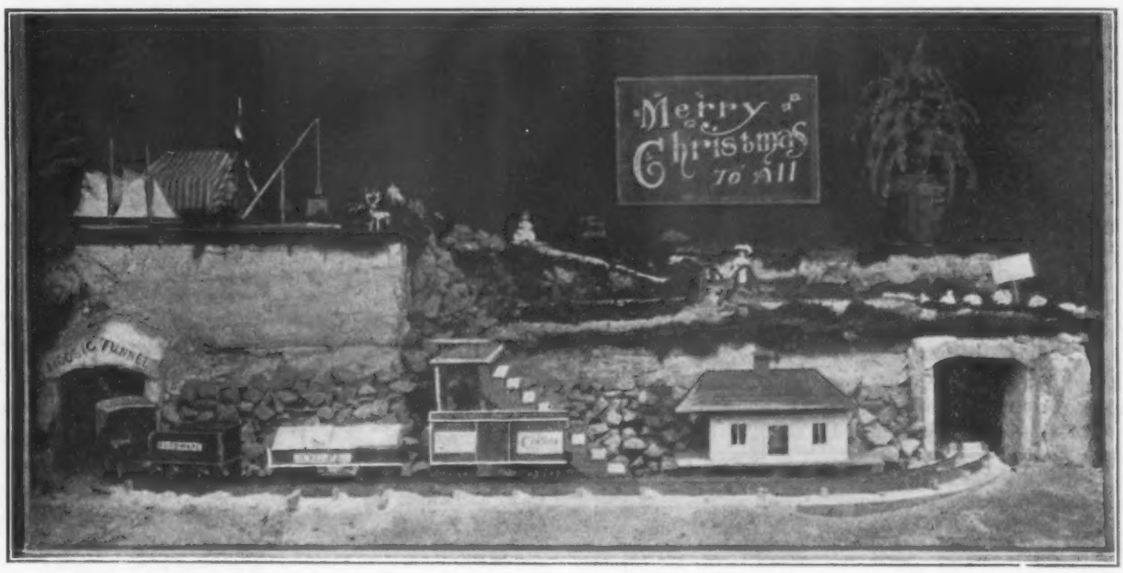
S. NORVELL, president of the Norvell-Shapleigh Hardware Company, St. Louis, Mo., has resigned his position as chairman of the Wholesale and Retail Hardware Joint Committee. Mr. Norvell offered his resignation last July at a meeting of the committee at Cleveland, but was prevailed upon to withdraw it for a time. In view of his departure, however, on a recreation and business trip to Central America and the Panama Canal, Hayti, Jamaica, Porto Rico and Cuba, which will occupy an indefinite length of time, Mr. Norvell decided it would be only fair to the committee to hand in his resignation at once. Mr. Norvell's decision will doubtless be received with sincere regret by the members of the Joint Committee and by the entire trade, who fully recognize and appreciate the able and dignified manner in which the duties of a responsible and onerous position have been discharged.

H. E. STIRN, Morristown, N. J., is distributing among his customers attractive art calendars for 1907. Mr. Stirn is an enterprising and up to date merchant handling general Hardware, Agricultural Tools, Seeds, House Furnishing and Sporting Goods. His store has acquired a considerable reputation in the metropolitan district from the fact that it is successfully conducted on a strictly cash basis.

THE SHELBY SPRING HINGE COMPANY, Shelby, Ohio, have prepared for distribution a neat little celluloid badge bearing the company's name and address and picture of the "Shelby Chief" Hinge, to which is attached a blue silk ribbon bearing the legend in gilt, "Enjoyment Committee," for distribution among members in attendance at the conventions of the Illinois, Indiana and Ohio associations.

CHRISTMAS WINDOW.

THE Christmas window display reproduced herewith was made by John M. Page & Co., Naugatuck, Conn., who have made it a point for 10 years past to have something of this sort for the holidays. The exhibit attracted a good deal of attention, and was the subject of much comment of a complimentary character The oval track, built on an embankment of white sand, was about 6 x 3 ft. The train consisted of an engine, tender and two freight cars, electricity furnishing the motive power. The passenger station at the left was constructed from cigar boxes. The arches were made of thin boards and cement plastered over them to give them a realistic appearance. On the upper level at the left was a pond about 24 x 36 in., with ducks, boats, &c., and back of that a summer camp. An old-fashioned well sweep and well were nearby with miniature settees and chairs. Water flowed over the dam into a winding trough, emptying into a smaller pond at the right of the window. A winding path of white sand led from the camp to the rustic bridge over the brook and on down to the stairs. The flat surfaces was covered with a handsome green moss gathered in the woods. Plants and evergreens were in the background.



Christmas Window of John M. Page & Co.

REQUESTS FOR CATALOGUES, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM L. A. PRICE HARDWARE COMPANY, which has purchased the business of G. C. Pennington & Co., Waverly, Neb. A retail business will be conducted, including Shelf Hardware, Stoves, Tinware, Paints, Oils and Buggies.

FROM ROGERS BROS., Newmarket, Iowa, successors to F. J. Rogers, who carry a stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods.

FROM G. W. HABBERSETT, Baltimore, Md., who is in the market for new lines of 5 and 10 cent Hardware.

FROM THE LYDICK MERCANTILE COMPANY, which has succeeded Harris & Lydick, Anthony, Kan. The company will conduct a retail business, carrying Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods, Queensware, Lamps, &c.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

WYETH HARDWARE & MFG. COMPANY, St. Joseph, Mo.: Spring catalogue, 1907, devoted to a large and varied line of season goods. A price-list accompanying the catalogue gives not approximate, but actual, prices.

BRONSON-WALTON COMPANY, Cleveland, Ohio: Catalogue devoted to Bread, Biscuit and Cookie Pans, Double Roasters and Bakers, Steel Coffee Mills, Heavy Tin Pails or Buckets, Wire Rope Clamps and Thimbles.

H. BEHRENS MFG. COMPANY, Winona, Minn.: Catalogue E relating to High Grade Metalware and Specialties, including Antirust Dairy Pails, Strainer Pails, Cream Cans, Tin Steamers, Tin Sprinklers, Milk Pans, Preserving Kettles, Wash Boilers, Galvanized Iron Washtubs, Grain Measures, Oil and Gasoline Cans, &c.

THE ELLER MFG. COMPANY, Canton, Ohio: Catalogue devoted to Metal Interior Decorations, illustrating Stamped Steel Ceilings, Moldings, Cornices, Stairway Wainscoting, Center Pieces, &c.

THE RICHARDS MFG. COMPANY, Aurora, Ill.: Monthly picture calendar advertising specialties manufactured; mailed each month upon application.

THE DAMASCUS TOOL COMPANY, 83 Pearl street, Boston, Mass., has succeeded the Diamond Tool Company of the same address. The name of the Hunting Hatchet made by the company has also been changed to the Damascus Hunting Hatchet. The change of name is made in the belief that the word Damascus better suits the merits of the Hatchet, which the company refers to as especially thin and tough.

THE THIRTEENTH ANNUAL DINNER of the St. John Iron & Hardware Association, St. John, N. B., was held on the 30th ult., at the Union Club in that city. An excellent programme of instrumental and vocal selections was given, while the responses to the various toasts were felicitous and instructive.

DINNER OF THE NEW YORK WHOLESALE HARDWARE SALESMEN.

THE wholesale Hardware salesmen of Greater New York participated in the first banquet of the kind given in this city in the rooms of the Hardware Club, Saturday evening, February 9. There was a reception from 6 o'clock until the announcement of dinner, about 7.30 p. m. This customary function was thoroughly appreciated by the salesmen and guests present, who while long acquainted in many instances, yet availed themselves of this occasion as an enjoyable opportunity for renewing and initiating friendships. It was realized by the Dinner Committee that such a gathering would serve to stimulate and perpetuate the spirit of good fellowship along the same lines as actuated the promoters of the Hardware dinner in 1892, which brought together the leaders in the trade and made possible the Hardware Club.

The Company.

While the company, nearly 170 in all, was primarily an assemblage of Hardware salesmen, there was a goodly representation of principals of leading Hardware houses. A flashlight photograph was taken of the company as soon as the guests were seated, after which an excellent dinner was enjoyed.

Dinner Committee.

The Committee of Arrangements was as follows:

Fred L. Stellwagen, Sargent & Co.
E. S. Massey, Sargent & Co.
Geo. W. Eadie, Harmon & Dixon.
Sol. Schoenhof, P. & F. Corbin.
Chas. H. Naylor, Yale & Towne Mfg. Company.
E. T. Lanterman, Russell & Erwin Mfg. Company.
Geo. L. Scwartwout, Corbin Cabinet Lock Company.
W. W. Crowell, Benjamin S. Alder Company.
W. H. Van Kuren, Reading Hardware Company.
E. A. Tissot, Underhill, Clinch & Co.
Benjamin S. Alder, chairman.

Guests.

The guests at the speakers' table included the following gentlemen: Edward C. Van Glahn, Henry R. Towne, George H. Sargent, Webster R. Walkley, R. R. Williams, George W. Corbin, J. Leonard Varick, William A. Graham, Harry W. Harmon, Arthur G. Sherman, Frederic E. Underhill, R. Lamb, W. Ludeke, Edward H. Darville and A. H. Chamberlain.

Toasts.

After coffee and cigars the toastmaster, Edward C. Van Glahn, a former president of the Hardware Club and head of White, Van Glahn & Co., called the assemblage to order and in an apt and humorous vein paved the way for the stated addresses of the evening. He then introduced Henry R. Towne, to whom was assigned the toast, "Contrasts."

Mr. Towne made comparisons between manufacturing and business, as now conducted, with a period nearly two score years ago, when the speaker entered the Hardware field. He emphasized the greater opportunities of the present, as contrasted with the earlier years, referring to the increase in population, wealth, development and buying power, to the expanded markets, both domestic and foreign, and the higher levels possible in placing products. He dwelt especially on the enhanced spirit of camaraderie among Hardwaremen of all stations, as compared with the ultra conservatism of the '60's and '70's. Mr. Towne paid a warm tribute to "the dean of Hardware manufacturers," George H. Sargent, who was present as a guest and whose health was drunk at a later hour by the entire company. Mr. Sargent, it should be said, was greatly interested in the plans for the occasion, and rendered the Dinner Committee much assistance, both of an advisory character and in a more material way.

The next toast was "Salesmanship," which was responded to by Webster R. Walkley, who closed his address by reciting one of his own poems. The last formal address was given by Richard R. Williams, Hardware Editor of *The Iron Age*, who was called upon for "The Editor's Views." In addition to the regular toasts, George W. Corbin, of P. & F. Corbin, was introduced by the toastmaster and responded with characteristic ability and humor. The speeches were interspersed with music, both instrumental and vocal, the latter including quartettes and solos.

Those Present.

Following is an alphabetical list of the entire company, which, in the form of a table index and accompanied by a souvenir menu and programme, was presented with the compliments of *The Iron Age:*

ABENDSCHEIN, G. P., Neal & Scott Co.
ABRAMS, LEWIS A., B. S. Alder Co.
ADAMS, G. T., Underhill, Clinch & Co.
ALDER, B. S., B. S. Alder Co.
ALDER, B. S., Jr., B. S. Alder Co.
ALEXANDER, T. A., Peck, Stow & Wilcox Co.
ALLEN, GEO. V., Coes Wrench Co.
ANDERSON, WILSON, Sargent & Co.
ARNOLD, W. H., Reading Hardware Co.
BALDWIN, C. H., Corbin Cabinet Lock Co.
BALDWIN, E. E., Eagle Lock Co.
BALTZ, E. G., *Hardware Dealers' Magazine.*
BAYNON, C. A., C. A. Baynon Co.
BEACH, F. H., Patterson, Gottfried & Hunter Co., Limited.
BEERS, GUSTAV, Fred Pfeifer.
BISSELL, EUGENE,
BLAIR, C. P., Corbin Cabinet Lock Co.
BLUMBERG, A. M., H. L. Judd Co.
BLUMBERG, WM. L., W. L. Blumberg & Co.
BOGGS, L. D., Mallory, Wheeler & Co.
BONSALL, F., Fox Brothers & Co.
BOOTH, W. H., Corbin Cabinet Lock Co.
BROWN, H. M., The Lockwood Co.
BROWN, KIRK, Yale & Towne Mfg. Co.
BUCHANAN, C. L., Russell & Erwin Mfg. Co.
BURN, A. V., P. & F. Corbin.
BURNETT, H. E., Sargent & Co.
BURROUGHS, W. C., Neal & Scott Co.
CARPENTER, E. B., J. H. Graham & Co.
CHAMBERLAIN, A. H., *The Iron Age.*
CHERRY, J. H., Sargent & Co.
CLARK, C. H., Harmon & Dixon.
COMFORT, C. L., Sargent & Co.
CONKLIN, F. D., Russell & Erwin Mfg. Co.
CORBIN, GEO. W., Corbin Cabinet Lock Co.
CORBY, GEO. F., Yale & Towne Mfg. Co.
CORNER, F. W., J. H. Graham & Co.
COTCHETT, JOHN P., J. H. Graham & Co.
CRAIG, A. C., Neal & Brinker Co.
CROWELL, W. W., B. S. Alder Co.
CUMISKY, J. H., Russell & Erwin Mfg. Co.
DARVILLE, E. H., *The Iron Age.*
DEWEY, CASSIUS M., Masbach Hardware Co.
DOUGLASS, IRA E., Topping Brothers.
DRAKE, E. J., C. A. Baynon Co.
DURHAM, K. S., Masbach Hardware Co.
DUYCKINCK, J. T., Russell & Erwin Mfg. Co.
EADIE, GEO. W., Harmon & Dixon.
FITCH, W. O.,
FOSTER, SOMERS, Warner & Haviland.
FOX, W. B., Jr., W. B. Fox & Brother.
FRAIM, WALTER E., E. T. Fraim Lock Co.
FRITZ, H., Sargent & Co.
GLENDINNING, T. A.,
GOMMENGINGER, V., J. Gordon Smith Co.
GROSHONG, H. H., Underhill, Clinch & Co.
GRAHAM, W. A., John H. Graham & Co.
GRIFFEN, W. L., Corbin Cabinet Lock Co.
HAMMER, A. J., Sargent & Co.
HARMON, HARRY W., Harmon & Dixon.
HASELTON, C. C., Russell & Erwin Mfg. Co.
HILL, WM. R., Yale & Towne Mfg. Co.
HOLME, JOHN L. B., J. H. Graham & Co.
HOLMES, W. D., P. & F. Corbin.
HOTCHKISS, RUSSELL, Mallory, Wheeler & Co.
HOWARD, C. CLARK,
HUTCHINS, FRANK E., Chantrell Tool Co.
HUSSEY, T. V., Sargent & Co.
KAMMERER, ANTON, Topping Brothers.
KELLY, F. J., Reading Hardware Co.
KIMBALL, L. A., Simonds Saw Co.
KNOBLOCH, CHAS., Neal & Brinker Co.
LAMB, R., Russell & Erwin Mfg. Co.
LANDON, LOUIS, Landon & Co.
LANTERMAN, E. T., Russell & Erwin Mfg. Co.
LAWRENCE, C. C., Sargent & Co.
LAWRENCE, CHAS. S., W. B. Fox & Brother.
LAWRENCE, H., Underhill, Clinch & Co.
LEONARD, V. CHAS., Eagle Lock Co.
LUDEKE, W., Aug. Eggers.
MADSEN, I. F., Peck, Stow & Wilcox Co.
MALONE, O. P., Russell & Erwin Mfg. Co.
MARSHALL, W. F., White, Van Glahn & Co.
MASSEY, EUGENE S., Sargent & Co.
MONTANYE, C. H., Neal & Brinker Co.
MORRIS, H. B., The Chas. Parker Co.
MUNSON, FRED, Sargent & Co.
McCARTY, L. J., J. C. McCarty & Co.
McCAUSLAND, M. R., Norwalk Lock Co.
McCULLOUGH, W. R.,
NAYLOR, C. H., Yale & Towne Mfg. Co.
NEAL, B. B., Neal & Scott Co.
NEGUS, W. V., Underhill, Clinch & Co.
OLIVER, FRANK J., Oliver Bros. Purchasing Co.
OLIVER, PHILIP, Sargent & Co.
ONDERDONK, DUDLEY, Biddle Purchasing Co.
O'NEIL, FRANK, P. & F. Corbin.
PACKARD, C. S., Reading Hardware Co.
PAHL, AUGUST, Hammacher, Schlemmer & Co.
PARK, DEAN, Hammacher, Schlemmer & Co.
PATTERSON, S., Simonds Mfg. Co.
PECK, R. N., Stanley Rule & Level Co.
PENMAN, E. T. B., Neal & Brinker Co.
PETERSON, E. E., Patterson, Gottfried & Hunter Co., Limited.
PFEIFER, FREDERICK,
PHILLIPS, N. I., The Lockwood Co.
PULS, WM. F., Neal & Brinker Co.
REDFIELD, C. S., Yale & Towne Mfg. Co.
RHINEHART, A. W., Sargent & Co.
SARGENT, GEO. H., Sargent & Co.
SARGENT, JOHN, Sargent & Co.
SCHOEMER, J. R., Sargent & Co.
SCHOEN, LOUIS, C. A. Stock & Co.
SCHOENHOF, SOL., P. & F. Corbin.

SCOTT, J. W., Neal & Scott Co.
SWARTWOUT, GEO. L., Corbin Cabinet Lock Co.
SEARS, S. N., Tucker Tool & Machine Co.
SERR, FREDERICK J., Hammacher, Schlemmer & Co.
SHADER, ERNEST J., Topping Brothers.
SHANN, JOHN, Jr., Masbach Hardware Co.
SHARP, F. J., Lufkin Rule Co.
SHELTON, R. S., Sargent & Co.
SHERMAN, ARTHUR G., SHERWOOD, H. A., Nicetown Plate Washer Co.
SMITH, E. L., White, Van Glahn & Co.
SMITH, HARRY, Neal & Brinker Co.
SMITH, J. G., J. Gordon Smith Co.
SMITH, JOSEPH V., Oliver Bros.' Purchasing Co.
SNYDER, C. H., Russell & Erwin Mfg. Co.
SPENCER, W. H., Sargent & Co.
STELLWAGEN, F. L., Sargent & Co.
SUTPHEN, V. M., Peck, Stow & Wilcox Co.
SWEET, L. N., Corbin Cabinet Lock Co.
TAIT, H. R., J. Gordon Smith Co.
TAYLOR, FRANK H., Yale & Towne Mfg. Co.
TAYLOR, G. F., Corbin Cabinet Lock Co.
THOMAS, W. I., Sargent & Co.
THOMPSON, W. H., Tower & Lyon Co.
THURNAUER, OTTO, G. M. Thurnauer & Brother.
TISSOT, E. A., Underhill, Clinch & Co.
TISSOT, L. F., Union Nut & Bolt Co.
TOWER, W. H., Tower & Lyon Co.
TOWER, WARREN M., Tower & Lyon Co.
TOWNE, HENRY R., Yale & Towne Mfg. Co.
UNDERHILL, F. E., Underhill, Clinch & Co.
VAN ANTWERP, S. C., Russell & Erwin Mfg. Co.
VAN GLAHN, EDWARD C., White, Van Glahn & Co.
VAN KUREN, W. H., Reading Hardware Co.
VAN NESS, WM. G., The Lockwood Co.
VAN WINKLE, EDO, J. A. Van Winkle & Co.
VARICK, J. LEONARD, Union Nut & Bolt Co.
VETTER, WM. L., Masbach Hardware Co.
VOGELSANG, H. C., Corbin Cabinet Lock Co.
WALKLEY, C. E., Peck, Stow & Wilcox Co.
WALKLEY, WEBSTER R., Peck, Stow & Wilcox Co.
WEEKS, W. V., Reading Hardware Co.
WESTON, PERRY, Sargent & Co.
WHEELER, BENJ., Stanley Rule & Level Co.
WIEPERT, GEO. F., Sargent & Co.
WILKENS, E. E., Patterson, Gottfried & Hunter Co., Ltd.
WILLIAMS, R. R., *The Iron Age.*
WOODWORTH, GEO. B., P. & F. Corbin.
WOODWORTH, R. C., Harmon & Dixon.
WRIGHT, J. FRED, Sargent & Co.
ZABRISKIE, EDGAR, Wilcox Mfg. Co.
ZUNDT, A. STEWART, Surpless, Dunn & Co.

Retail Hardware Conventions.

During the next few weeks the following retail Hardware conventions will be held.. Where special arrangements have been made for Hardware exhibits by manufacturers and jobbers the fact is noted:

NORTH DAKOTA RETAIL HARDWARE ASSOCIATION. Meeting postponed until further notice. Secretary, C. N. Barnes, Grand Forks.

CONNECTICUT HARDWARE ASSOCIATION, Hartford, February 20 and 21. Secretary, J. De F. Phelps, Windsor Locks.

NEW YORK STATE RETAIL HARDWARE ASSOCIATION, Syracuse, The Alhambra, headquarters the Yates, February 19, 20, 21 and 22. Hardware exhibition. Secretary, John B. Foley, Syracuse.

IOWA RETAIL HARDWARE ASSOCIATION, Des Moines, February 19, 20, 21 and 22. Headquarters, Savery Hotel; Meeting at Christian Church auditorium; Hardware exhibition at Shriners' Temple. Secretary, A. R. Sale, Mason City.

INDIANA RETAIL HARDWARE ASSOCIATION, Indianapolis, February 20, 21 and 22. Hardware exhibition. Secretary, M. L. Corey, Argos.

OHIO RETAIL HARDWARE ASSOCIATION, Columbus, February 26, 27 and 28. Headquarters, Southern Hotel. Hardware exhibition at Memorial Hall. Secretary, Frank A. Bare, Mansfield.

MINNNESOTA RETAIL HARDWARE ASSOCIATION, St. Paul, Knights of Columbus Hall, February 26, 27, 28, March 1. Hardware exhibition. Secretary, M. S. Mathews, Boston Block, Minneapolis.

CALIFORNIA RETAIL HARDWARE ASSOCIATION, Los Angeles, March 20, 21, 22. Secretary, F. B. Dickson, 1011 Market street, San Francisco.

ASSOCIATION NOTES.

Iowa

We have already referred to the programme for the convention of the Iowa Association at Des Moines, February 19 to 22. In a circular calling attention to the meeting, the following reference is made to the features of the convention:

1. A four-day convention and a spicy programme.
2. A four-day Hardware exhibit.
   a. The best things made in 75 factories.
   b. Occupying both floors of the beautiful Shriner's Temple.
   c. A window dressing exhibit of the best Hardware show windows in Iowa.
   d. Daily window dressing demonstrations.
3. An address by the president of the National Retail Hardware Association.
4. An evening's entertainment by the Des Moines Hardware Club.
5. Railroads give a one and one-third round trip ticket. No certificate needed.
6. Last, but not least, an opportunity to line up and talk face to face with the best fellows in trade—the retail Hardwaremen of Iowa.

The officers are making every effort to make the 1907 convention the best in the history of the association.

New York

The official programme for the meeting of the New York State Association, February 19 to 22, at Syracuse, has just been issued. Among those who will address the convention will be W. P. Bogardus, ex-president of the National Retail Hardware Association, George H. Sargent, Sargent & Co., New York City, who will have for his subject, "Looking Backward"; L. B. Elliott, Rochester, N. Y., who will discuss "Advertising in Relation to the Hardware Dealer," and W. M. Pratt, of the Goodell-Pratt Company, Greenfield, Mass., who will touch on the subject of "Tool Topics." The entire morning session of February 21 will be devoted to the discussion of Question Box topics under the supervision of the committee having the matter in charge. This promises to be a very interesting and instructive feature of the convention. As already announced, the business sessions of the conventions will be held in the afternoon, leaving the members free to give their attention to the numerous exhibits made by manufacturers and jobbers in the morning.

Ohio

The Ohio Hardware Association has received an unusual number of accessions to the membership during the past few days, largely through the efforts of the traveling salesmen in the State, who have been taking a deep interest in the cause and have induced many merchants to affiliate with the association. We understand that practically all the space in the exhibition hall has been disposed of, and there will be a very large and artistic display of goods in which the Hardwaremen will be especially interested. It is expected that President Bush and Secretary Corey of the National Association will be present at the convention and make addresses.

THE SASH WEIGHT MANUFACTURERS.

THE Sash Weight manufacturers of the country had a large and successful meeting in New York last week. Reports from all quarters indicated a satisfactory condition of things and a heavy current business, taxing the producing facilities of the various foundries. The conferences concluded with a banquet on Thursday evening at the Café Martin, which was greatly enjoyed by the members. Dr. E. E. Brown, the popular and efficient president of the association, introduced as toastmaster J. C. Brainard of Cleveland, who felicitously directed the after-dinner proceedings. Among the speakers were N. H. Reed, Boston, Mass.; R. R. Williams, *The Iron Age*, New York; D. S. Loughran, Brooklyn, N. Y.; Wilson K. Levering, Baltimore, Md.; Arthur Ross, New York; B. H. Fry, Amenia, N. Y., and N. S. Cahoun, Cleveland, Ohio.

1907 CATALOGUE OF ANDREW B. HENDRYX COMPANY.

ANDREW B. HENDRYX COMPANY, New Haven, Conn., is distributing its new catalogue for 1907. It covers the entire line of goods made by the company and is replete with illustrations. Special attention is devoted to the elaborate assortment of Bird and Animal Cages and Cage Specialties, and also to the company's extensive line of Reels, Spoons, Feathered Hooks and other Fishing Tackle. Bronze, Brass and Iron Chain and Wire Picture Cord are also included in the catalogue.

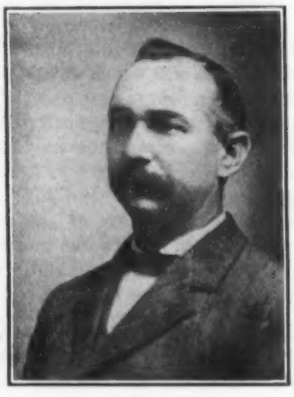
Nebraska Retail Hardware Association.

CONCLUDING REPORT.

OUR last issue described the opening session of the sixth annual convention of the Nebraska Retail Hardware Association, held at the Auditorium, Omaha, which commenced Tuesday morning, February 5, with a large attendance.

State Legislation.

The Wednesday morning session opened up with an address by Harry Fischer, Omaha, an officer of the Nebraska Retail Merchants' Association, in regard to taking action on House Bill No. 261, introduced in the Legislature recently by Representative Scudder of Hall County. The bill, according to Mr. Fischer, proposes to cut down general exemption from $500 to $300, to eliminate many of the specific exemptions provided for by present laws, and allow exemption of wages for a specified time, only to the amount of 75 per cent. The convention instructed its Resolution Committee to draft res-



FRANK HACKER.

olutions favoring the bill and suitable for presentation to the members of the Legislature.

Convention Committees.

President Roberts appointed the following committees to act during the convention:

NOMINATING—J. C. Cornell, Ord; A. C. Newberry, Alliance; C. F. Schneider, Syracuse.

PRESS—C. F. Schram, Omaha; E. S. Hayhurst, Loup City; Anton Hansen, Upland.

RESOLUTIONS—S. A. Sanderson, Lincoln; A. F. Montgomery, Creighton; P. G. Satt, Wausa; P. F. Connant, Benedict; Frank Lahr, Lincoln.

GRIEVANCE—Ray Weaverling, Peru; Max Uhlig, Holdredge.

Treasurer's Report.

Treasurer H. J. Hall, Lincoln, reported a balance on hand of $1,329.29. Receipts for 1906 were $3,553.92, while expenditures were $2,224.63.

Officers Elected.

The following officers were elected for the ensuing year.

PRESIDENT, Frank Hacker, Friend.
FIRST VICE-PRESIDENT, A. F. Meyer.
SECOND VICE-PRESIDENT, W. Wisda.
THIRD VICE-PRESIDENT, Fred Ebinger.
SECRETARY, J. Frank Barr, Lincoln.
TREASURER, H. J. Hall, Lincoln.
EXECUTIVE COMMITTEE: Dan. Kavanaugh, Fairbury; E. S. Hayhurst, Loup City; J. W. Armstrong, Auburn.

The invitation of Lincoln was accepted and next year's convention will be held in that city.

Entertainment.

Tuesday evening the members of the association were the guests of the Wright-Wilhelmy Company, and the Lee-Glass-Andreesen Hardware Company at a smoker at the Commercial Club, which proved most enjoyable. The visiting ladies were the guests of the Omaha ladies at the Boyd Opera House, and on Wednesday afternoon a reception was given at the Iler Grand for the visitors.

Wednesday evening the delegates were tendered a musicale at the Auditorium, given by the exhibitors at the convention. The entertainment was furnished by the Elks' Quartette and Prof. Dimmick's orchestra.

Parcels Post vs. Penny Postage.

An interesting paper was that by Ray W. Weaverling, Peru, entitled "Parcels Post *vs.* Penny Postage," in part as follows:

It is a fact not to be denied nor hidden that there are many forces arrayed upon the side of parcels post, a number of which, in all logic, should be with us and for us, but instead have aided in influencing the adverse attitudes of many of those in authority. Potent among these forces is the influence that has been exerted by the farmers of the country. It is an unfortunate fact that the principal farmers' organizations of the country, and especially those throughout the West, have come out so strongly for parcels post. For example, we contemplate the action of the National Grange in its recent convention at Des Moines. I believe that it is a lack of knowledge that is responsible for this attitude; that it is a misunderstanding, rather than an understanding of the motives actuating this parcels post agitation.

FARMER HAS BEEN MISLED.

Be this as it may, the fact remains that the average farmer that I know anything about is so completely blinded by the illusion that he can save a few cents on a dollar when he sends that dollar on its mission to some catalogue house, that he cannot see that, in the end, he'll be the loser to a far greater extent through the depreciation of his own property and through the partial destruction, at least, of his local market. This fight for the parcels post system is the fight of the catalogue house for cheap transportation for its merchandise which it proposed to sell, if not by fair means, then by those that are at least questionable, and it is not the fight of the farmer. If he were made to see this and to realize all that is involved in its solution, I believe that then the catalogue house will be deprived of one of its most potent weapons. It is not an easy matter for one of us to approach him upon this subject.

During my brief business experience I have come into contact with a great many of this class of people; in contact with more perhaps than has the man who caters to the city trade. Since my recent study of this question I have cultivated an acquaintance with the views of some of the more progressive and intelligent of this class of our trade, and I want to say to you that, even

NATHAN ROBERTS.

A. F. MEYER.

though he be a fairly loyal customer, you will in nine cases out of ten engender him with the idea that you are trying to deprive him of a modern luxury and that your interest is entirely selfish. I find that he is well stocked with catalogue house arguments, and can justify to his own satisfaction the stand that he has taken.

This shows what? It shows that the catalogue house has secured his sympathy and his enlistment by smoothly written advertisements and deceptive prices. It has made a strong bid with him for his patronage by teaching him that his local merchant is a robber, while the

catalogue house is the only good institution doing business to-day, because it does it for that eternal 1 per cent. of profit added. It has made a strong bid for his continued patronage by telling him that his local merchant purchases his supplies from the said catalogue house upon exactly the same terms and at the same prices that he is privileged to buy them.

It might be in order to state here that I do not believe there is a single intelligent human being in business for himself or for profit who purchases his supplies from a catalogue house, and yet so far have their misleading statements been believed that within the last month I have had no less than four of my farmer friends ask me if it is not a fact that I purchase a portion of my supplies from these people. When these people have been able, by various methods, to induce and promote the be-

FRANK BARR.

H. J. HALL.

lief that there are many local merchants numbered among their best customers, a statement full of malicious intent, it is not to be marveled at that they have been able to exert such an influence upon the farmers, individually and collectively, in regard to the parcels post system. This is a question that I have never seen discussed, but I believe that it is nevertheless a most important one, and one that is calling for more attention than it has received. If there is no method by which we can reach the farmer and reverse his present attitude, then we must exert every other legitimate influence at hand that this sentiment may be overcome or nullified.

CAMPAIGN OF EDUCATION.

In connection and in continuance with this thought I will mention that there seems to be an effective and feasible plan unfolding which, so far as I know, is independent of any action taken by our association, but which should receive the encouragement to the fullest extent. One of the principal publishing syndicates of this country, which furnishes to hundreds of the weekly papers of the smaller cities and towns their inside reading matter, is willing to conduct a general campaign of education along this line. Notwithstanding the gradual increase of circulation of the large daily papers in our rural communities, the local papers still maintain and will retain an effective hold upon their communities. Therefore we must not underestimate the value of the help that our local editors can give us, and in most cases are willing to render. The action of this publishing syndicate to which I have referred is prompted by that knowledge that the further encroachment of the catalogue houses upon the retailer's field means, at least, a decrease in the amount of advertising that the retailer will be able to do, and this in turn will have its effect upon them.

ATTITUDE OF THE ADVERTISING AGENTS.

Some one has said that an effective way to bury the parcels post and the mail order method is to reverse the attitude of the advertising agents. This cannot be done until the manufacturer and the jobber are with us. I am happy to say that in this regard we are more fortunate than those engaged in allied trades. The wise advertising man realizes that his future business depends upon the manufacturer of staple commodities. The manufacturer realizes that all the advertising that he may do is of no avail unless he has the co-operation of the retailer. Now, if the retailer is a necessity to the advertising man and the manufacturer, then is he also a necessity to the press, which the latter practically controls. If the manufacturer will give that advertising man to understand that the parcels post idea and the mail order method are inimical to his interests because inimical to the interests of the retailer, you may depend upon it there will be a sudden decrease in the amount of questionable publicity now given to the mail order crowd, because of the simple fact that 85 per cent. of the accounts of a reputable advertising agent are such as must have the retailer make good.

IT IS NOT AN UNCOMMON THING

for the friends of the parcels post to insist, in order to pacify the merchant class, that the proposed measures would be of interest to them, especially to the smaller merchant. As has been pointed out, the only profit that is allowed the retailer to-day on many articles is the differential between freight and express charges. The proposed measures would affect first and directly the lighter class of articles or those falling within the 11-lb. limit. It would send Firearms from Connecticut to the western coast at the rate of $2.25 per 100, while the freight rate is $3 per 100. In other words, Uncle Sam would carry by mail in six days for $2.25 the same number of Guns that the railroad companies would charge $3 for and require from 20 days to six months for delivery. Now, let us turn our attention to the articles falling without the weight limit or those over 11 lb. As I have hinted, we are permitted a profit on many articles of this class at the present time simply because of our nearer location to the articles desired. This nearer location means a saving in time and expense of transportation, which is converted into profit. Now, the point that I wish to make is that if the parcels post idea goes into effect, the mail order business would become so profitable that mail order houses would soon spring up in all our larger cities. Do you not see what would be done to the profit on this heavier class of goods in this event? I do not believe that it is necessary to answer this question.

PENNY POSTAGE.

While the promoters of the parcels post idea are doing their utmost to further their project, our own friends are meeting them with a counter proposition, which if acted upon favorably would result in quieting their overwrought nerves, and which has the commendation of fairness and justice. I refer to the penny postage scheme. There is an annual deficit of $10,000,000 to $12,000,000 in our postal department, and it is estimated that should the parcels delivery system be adopted this deficit would be increased many millions the first year. This amount seems amazingly large, but let us bear in mind that if it were not for the fact that the Government is charging us thirty times the amount it costs for the transportation of our first class mail it would be several times greater. We are aiding in reducing the enormous deficit of $50,000,000 that is caused by the Government carrying thousands of tons of publishers' mail at a loss. There is a peculiar inequality existing that permits the senders of second class matter to profit by reason of others having to pay excess rates on first class matter. It is not

DAN KAVANAUGH.

J. H. McGRATH.

advocated by the most rabid of the parcels post theorists that that system would aid in the least cutting down the existing deficit. At the same time it is recognized by good authorities that an equitable adjustment of the rates on different classes would tend to dissipate this deficit, and indeed that this step would eventually put the Post Office affairs of this country upon a sound basis. That this fact is becoming realized more and more every day is to be seen from the comments of the daily press. Therefore, it is up to us to give the penny postage scheme a boost every chance we get, for in doing so we are giving the parcels post idea a knock.

Hardware Merchants Not Dealers.

This was followed by a paper by F. W. Arndt, Blair, on "Hardware Merchants and Not Dealers," as follows:

As we note the names or terms commonly used in other lines of business we wonder why such an every-

day name (you might call it) as Hardware dealer was ever given to our profession. Is it not up in this world to other lines and deserving of the best, a business that takes more brains and more years of experience to carry on successfully than the average trade? We speak of dry goods merchants, not dry goods dealers; grocers, not grocery dealers. In the larger cities we find Iron merchants, not Iron dealers. Let us rise to a little more dignity in our calling. Hardwareman is good, but Hardware merchant is better. We find that the Lumber dealers are changing to Lumbermen and Implement dealers to Implementmen, while we in our chosen business, called Hardware dealers, seem to be classed in name similar to junk dealers, rag dealers, &c. I think you will all agree with me that the name "merchant" is more applicable and carries with it more dignity and meaning than the term "dealer." We find among the class of men engaged in the Hardware trade some of our very best business men. Men who have ability, good judgment and sound business principles, that average up fully to the best in other lines of business.

I fully believe that you will find among the Hardware merchants more upright and honest men, as it is very seldom we hear of one in our trade selling out in some way to beat his creditors. Of course we have some of them also, as every organization has its black sheep.

There are men in the Hardware business who, we may say, have missed their calling, judging from the looks of their stores, and noticing their business ways they are about 25 years behind the times. They are not up to date in business methods, but going along in the same old rut as their forefathers did. There are others who see that they are losing ground, they are fully aware of it, but they are too stubborn to change from their old accustomed way of doing business, while their competitors in the next block, so full of vim and tact and alert whenever opportunity presents itself, are getting the business and drawing the people. Such a back number man as first mentioned may be designated as a "dealer." The man at the helm who shows his skillful ability and enterprise is entitled to the more elevating name of Hardware merchant. I am glad to say that to-day we find very few of these "mossback" Hardware dealers in this State of Nebraska.

An effort should be made along the line to get this change of name fixed upon the minds of the people, through the trade papers and on our stationery, that the reform may be more quickly brought about. Of course the old habits and customs will have to be dropped. Hardware merchants can very much assist by eliminating from their advertisements the word "dealer," or "dealers," which are superfluous. We find the different State Hardware associations are one after another dropping

H. T. MOORE.

C. L. KELLY.

the word "dealer," as they seem to agree that the term "Hardware merchant" is more proper.

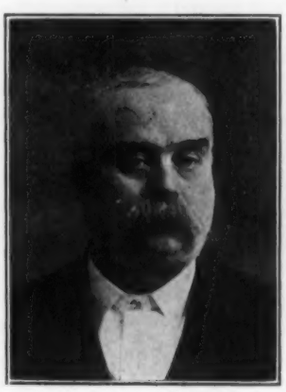
Permit me to add my personal experience on business names: After a good number of years' partnership I assumed, four years ago, by purchase, the entire business. For change of name I adopted from then on, "The Arndt Hardware." My object at that time in making this choice was to connect the name with the business. Among our people nowadays, instead of hearing them speak of the "Arndt Store," we hear the common saying, "Arndt's Hardware," which states the kind of business when spoken, and is that much advertising. Since then two of my competitors began to advertise their business in the same way.

The difference between keeping store and being a merchant is the difference between merely existing and truly living.

Loyalty to Our Association and Hardware Mutual Insurance Company,

was the title of an address by Albert Degner, Norfolk, in part as follows:

When a man joins an organization or society, he does so with the idea and purpose of thereby benefiting himself. It may be an honorary organization, or it may be one through and in which the new member will gain material benefits. But whatever kind of an organization it may be, some benefits should be derived from the membership or the purpose of the organization is lost. If, then, this organization confers benefits upon the member from the fact that he is such, what is the duty of the member of the organization? There is but one answer—



S. E. OAKS.

RAY W. WEAVERLING.

"loyalty to the association." This is the very foundation of the structure of voluntary organizations, and without it the structure will crumble and fall into deep ruins of failure. It is required from every member and officer of the Nebraska Retail Hardware Association. I am glad to say that they have all shown loyalty by helping to strengthen our organization in membership. But we can still more show our loyalty in aiding our officers to get more of the Hardware merchants to join, so that before another convention time rolls around at least 50 per cent. of the Hardware merchants of our State will be members of our association.

Let us show our loyalty to our officers, especially the president and secretary, who so loyally work for all of our interests. When our secretary writes to us or sends us any communication of any kind, let us answer him by return mail and show him that we appreciate hearing from him, and let us comply with his request, whatever it may be.

Let us be loyal to our National Association, as it is doing such a world of good for us in combatting with our enemies, the mail order houses.

Let us show our loyalty to our friends the jobbers. I mean by them the Hardware jobbers, who so loyally stand by us and say, "We do not sell to catalogue houses and every grocery house there is in the country, but only to the legitimate Hardware trade."

Last but not least, let us be loyal to the traveling men, as they are the "traveling missionaries" of our association and do lots of good for it. They are not "knockers," but "pushers" and our "friends."

It must certainly be gratifying to the officers of our Mutual Insurance Company that the members have shown their loyalty to it. A year ago, so the secretary informs me, we had 117 policies in force and this year we have over 300, which shows a very nice gain. Last year we received a rebate of 20 per cent., and it may perhaps reach 25 per cent. this year, and if all the members will come into the "band wagon" and take out policies this can be brought up to 30 or 35 per cent. It is certainly a nice saving on the expense of insurance.

Wednesday Afternoon Session.

A feature of the afternoon was an interesting address by W. S. Wright, Omaha, president of the National Hardware Association. After telling how the Omaha jobbers, not in Hardware alone, but in all lines, had helped the Nebraska merchant by a successful fight to keep catalogue houses out of Omaha, he advised the merchants to buy from no house which does a half jobbing and half retail business.

S. R. Miles, Mason City, Iowa, vice-president of the National Retail Hardware Association, made an able

address, in which he dwelt for the most part on the benefits of mutual fire insurance as offered by the different companies operated under the auspices of the Hardware associations.

R. N. Hurlbut, Hartington, was present with a suitcase full of cards, booklets and other advertising matter to show how he advertised a country store. Admitting the newspaper to be the best advertising agency, he showed how to use other agencies to the best advantage.

Selling Goods with Little or No Profit.

C. C. Howell, Fairbury, talked on the subject of "Selling Goods with Small Margin or No Profits." He advocated the organization of a State Hardware credit bureau for the protection of the merchants. Mr. Howell's paper was in part as follows:

No doubt this is the very easiest proposition in the entire retail Hardware business to-day; easy to do, and, at times hard to keep from doing. I have been behind a retail counter for 27 years, and in all my experience I

F. W. ARNDT.

ALBERT DEGNER.

find as a rule the selling of merchandise without profit is largely due to not knowing the cost of doing business. How many of you can tell the exact per cent. of cost of selling, or the per cent. of profits on gross sales of your business last year? I presume but few. Then again, you carry too large a stock. If you cannot turn your stock at least four times during the year you are not getting the per cent. of profit out of capital invested you ought to. In my experience I have never found one who knew what his cost of merchandise was at the time of delivery to customer. We often find a merchant who says, "That Cook Stove cost me $19.60 at the factory, and I get $25 for it." A pretty good profit, he thinks. But let us see when he figures his freight, drayage, blacking, one joint of Pipe, Damper, delivery and setting up, together with his store expenses, we find his Stove cost him nearer $23.50, leaving him $1.50 for profit. This same merchant will wonder where his profits are gone and why he failed in business.

Again, some of us get the idea that we will sell every customer who comes in, regardless of circumstances or price, just to show the fellow down the street that he is not the "only one." A customer comes in and says he can buy a 10-in.Strap Hinge from Jones for 15 cents a pair. You tell him he certainly is mistaken, that it must have been a 6-in. He assures you that he knows a 6-in. from a 10, and you, after using your best arguments to change his mind, sell him a pair of 10-in. for 15 cents, only to find out later that the fellow down the street refused to sell him at that price, and he took this means to "work you." I need not tell you that in every town we find this customer in limited numbers.

I think a good way to increase profits would be a State retail credit organization, composed of all retail Hardware dealers.

I think that each merchant should get a reasonable profit on each thing that he sells; it is the 5 per cent. advances that cut down his profits, as he cannot advance his selling price on a line on his shelves to cover this. He is doing business with a class of people who will not stand for these small advances as they come. If you can make the additional cost larger, and not come so often, it will be better. For instance: Granite Ware is sold to-day for 85 per cent. You sell a 4-qt. basin for 25 cents to Mrs. Jones; her neighbor comes in to-morrow and you ask her 27 cents for the same Basin; you all know the result. While with the jobber, he can advance 2 per cent., or 5 per cent., or 10 per cent., and at once he gets that price. I do not think that prices should always remain the same. I think they should conform to the cost of production, but I do contend that if advances come by telegram, declines should come the same way; not by slow freight.

If you intend making the year's business show a good profit, it is necessary to use good judgment in marking goods. The consumer of merchandise is a queer piece of humanity; you may sell him Tacks at 5 cents a paper that cost you 1 cent, making 400 per cent. profit, but if you ask him 20 per cent. profit on Copper Rivets he thinks you are a robber.

I am a firm believer that quite a part of our selling goods without profit is due to local conditions, and I think if in each town or city each Hardware dealer would try to be frendly with his competitors he would succeed. Do not think that your competitor is a rascal; he may have the same opinion of you. Meet him halfway, and then you will both sleep better, your families will be happier, and last, but not least, your profits will be better.

Aims of the Hardwareman.

The Thursday morning session was opened with unfinished business, which was followed by an address by Louis Wirth, Falls City, entitled "Aims of the Hardware Merchant; What They Should Be." Mr. Wirth's paper was in part as follows:

The first aim of a Hardware merchant, I presume, is from a lucrative standpoint—to make money—and this can be best attained by getting the confidence of your customers, and this confidence can be attained by practicing strict honesty combined with a knowledge of our business. Our aim should be to represent things just as they are.

We should aim to sell high grade goods wherever possible, also keeping cheap articles; I say keep them, but to sell the better ones whenever we can. It will be more satisfactory to your customer in time to come and more profitable to you, since you will have a satisfied customer who will come again and even advertise you to your advantage.

The jobbers throughout the land have been especially zealous to acquire a high grade of Cutlery and Tools, and I think through their efforts it is due that to-day the general public when in search of a first-class Edge Tool will invariably seek to find it at the Hardware store.

It should be our aim to be above using tricks and sharp practices, and especially misrepresentations. These are unprofitable and beneath the dignity of a merchant,

C. C. HOWELL.

L. P. WIRTH.

and are only illegitimate children that sooner or later will come home.

FRIENDSHIP AMONG COMPETITORS.

I wish to say a few words about cultivating friendship among your brother opponents. We are good fellows here. Why not be the same when we get home? I tell you it pays. In the first place, it is so much pleasanter to do business where all get along as one family, and then you can often make money by so doing. In the southeast corner of the State, where I come from, we visit each other and people think nothing of it. We buy together often and save thereby. Recently we bought a car of Galvanized Sheet Iron and our saving was quite an item. I can get anything in my competitor's store, and *vice versa*, even so far as getting his mechanics to help in an emergency. How to attain this is not my subject, and ought to be decided by each one according to his surroundings.

CREDIT.

In this day of progressiveness and close competition I think it ought to be our aim to conduct a Hardware

business without combining it with a general banking business. I do not know how you are troubled in this line, but in our county we still have to contend with giving time. Too long time is asked, and this by the so-called best trade. Our aim should be to eliminate this evil, for I say, if you sell a man goods upon which your profit, say, is $10, and you give him time until the interest has consumed the $10 what have you made?

We ought to get some systematic way, and I would be pleased next year to hear from some one who has solved this problem, for we have not.

NO TROUBLE WITH CONTRACTS.

In the line of large contracts, and even small contracts, we have disposed of this credit obstacle to our entire satisfaction. Several years back we sold quite a number of Furnaces and had nearly all or at least the greater part unpaid by January 1. Our customers would in plain and sometimes stormy language state that they felt we failed to carry out part of the contract agreed upon, but the matter of pay was always the last one and neglected.

We branched out and took larger contracts, such as installing steam plants. The mother of necessity made it necessary that we must receive the money promptly. We now always make a contract embodying all that we are supposed to furnish and do, and in the round-up we state how payment must be made, and in all cases, in the past two years it read thus: Two-thirds of the amount to be paid when all the material is on the ground and work commenced, the balance to be paid when work is done and accepted. Close at home our guarantee is sufficient. Where we go quite a distance from home or deal with school boards or church trustees, we give a surety bond for one year, guaranteeing the work. Such a bond is easily procured; minimum cost is $5, or ½ per cent. of amount of bond. We figure these bonds in the cost of the work. Now our experience has been very flattering. Invariably a job settled and paid for gives better satisfaction than one open and where the parties are always looking for fault, and last year we had quite a lot of large and small contracts, and by our invoice just closed not a single one is unpaid and all satisfied.

Many customers do not want a contract, but we say, "I will write out a specification of just what goods we will furnish, and how it shall be installed," saying nothing about pay until they see it, and right there any objection is readily overcome.

But on a running account it is different. I would like eventually to get to a plan of 60 days net, just as we get our goods, and our aim ought to be along these lines, for in our county at least we are behind the times in this line. The long credit system is faulty and unprofitable.

Resolutions.

The resolutions adopted were as follows:

Resolved, That we, the Nebraska Retail Hardware Association, assembled in convention at Omaha, extend our sincere and hearty thanks:

1. To the Hardware jobbers of Omaha for their courtesy in entertaining the merchants of the State and their friends.

2. To the retail merchants of Omaha and their wives, who have so ably contributed to the entertainment of the visiting guests.

3. To our friends, the exhibitors, who have contributed so largely to make this Hardware exhibition a success, also for the very enjoyable entertainment provided for Wednesday evening.

4. To *The Iron Age* and other trade papers, for the mention they have made in their papers of our association and our work.

5. To our worthy president, secretary and all of the officers and committees, whose untiring efforts have been put forth for the past days and weeks for the promotion of the cause of the Hardware merchants of Nebraska and of this convention in particular.

Members Present.

The following is a list of association members present:

F. M. Housh, Neligh.
T. V. Weinhold, Fremont.
H. C. Hansen, Shelton.
A. R. Kovands, Table Rock.
Edw. G. Weinhold, Craig.
M. M. Cline, Bradshaw.
J. E. Blank, Palmer.
F. W. Arndt, Blair.
C. L. Kelley, North Bend.
Theo. Heurlin, Swedburg.
L. C. Hill, Campbell.
C. L. Smith, Bradshaw.
J. W. Wright, Kearney.
A. M. Fries, Odell.
E. L. Myers, Newport.
Geo. Goodbrood, Utica.
C. S. Frank, Memphis.
E. H. Bush, Fremont.
Wm. F. Morris, Schuyler.
W. E. Gamel, Loomis.
Thornton & Son, Fairbury.
J. W. Armstrong, Auburn.
W. H. Hobart, Riverton.
John Bring, Craig.
W. H. Eifert, Marion.
L. P. Crittondon, Franklin.
Dan Kavanaugh, Fairbury.
H. Craven, Wayne.
Fred A. Miller, Aurora.
W. Edberg, Stromsburg.
Victor Anderson, Polk.
H. G. Markell, Nebraska City.
C. F. MacGlasham, Marquette, Wyo.
E. M. Coleman, Merna.
Rudge & Guenzel Co., Lincoln.
J. L. Bell, Franklin.
August E. Anderson, Holdrege.
F. O. Broz, Prague.
A. M. Tilden, Jansen.
C. A. Newbery, Alliance.
Geo. G. Hart, Cowles.
J. F. Souchek, Deweese.
J. W. Rupp, Seward.
R. A. McCartney, Ashland.
J. L. Michalsen, South Omaha.
F. W. Hungate, Herman.
C. E. Brown, Carleton.
Chas. A. Ralson, Shickley.
N. K. Hansen, Bancroft.
G. C. Feitch, Bancroft.
Fred Holt, West Point.
C. A. Townsend, Page.
W. E. Kennedy, Geneva.
J. E. Brook, Atkinson.
J. Harvey, Hubbell.
A. R. Clarke, Ashland.
R. E. Bicknell, Elk Creek.
S. A. A. Walker, Gibbon.
M. A. Harglaroad, Holden.
L. C. Harrington, Pawnee City.
E. G. Holmes, Bloomington.
Claus Peters, Yarton.
Milton Rogers Co., Omaha.
Johnson Hardware Co., Omaha.
Merle R. Wilcox, Cozad.
James L. Farrell, North Bend.
Frank Lahr, Lincoln.
M. J. Hurbut, Hartington.
J. E. Knedler, Fullerton.
O. W. Rasch, Alexandria.
Chas. Perry, Harvard.
E. G. Dahlstrom, Seresco.
James Morton & Son Co., Omaha.
H. M. Mueland, University Place.
Hans Hanson, Millard.
John Rilfschneider, Beemer.
L. A. Higgins, Harvard.
J. O. Blouse, Diller.
T. R. Callam, Odell.
H. W. Husband, Gresham.
E. A. Moore, Tobias.
W. H. Cook, Beaver Crossing.
J. B. Thomas, Lyons.
O. L. Miller, Ravenna.
O. S. Macintyre, Wolbach.
Wm. Kinzell, Wisner.
J. J. Stillson, Atkinson.
Fred Glazer, Stanton.
Cozad Hardware Co., Cozad.
Fred W. Ebinger, Plainview.
H. C. Wittman, Lincoln.
J. J. Gish & Co., Juniata.
C. A. Lord, Shubert.
L. P. North, Falls City.
W. H. Saunders, Winnetoon.
D. W. Lightner, Lynch.
W. M. Smeltzer, Rockville.
Jas. S. Lubley, Hartington.
E. D. Hirschman, Hartington.
T. S. McDonnell, Eagle.
A. E. Donnell, Crete.
Ernest Grauer, Wind Side.
Burwell Hardware Co., Burwell.
E. H. Warrington, Creighton.
M. W. Swearingen, Stockton.
B. Larson, Wausa.
P. G. Satt, Wausa.
W. C. Klein, Milford.
E. W. Shaffer, Tecamah.
A. O. Anderson, Waverly.
Dwight Jones, Guide Rock.
C. H. Meachem, Jr., Dorchester.
J. E. & E. W. Pattison, Minden.
Jacob Krebs, Humphrey.
J. W. Hunter, Aurora.
W. D. Byrne, Bertrand.
L. P. Byers, Valley.
W. D. Hussey, Omaha.
F. J. Hoerger, Sutton.
E. D. Patton, Omaha.
Geo. R. Wycoff, Madison.
H. F. Meyer, Nebraska City.
Geo. W. King, Omaha.
R. H. Goodge, Leigh.
John Bauer, Plattsmouth.
H. F. Moore, Prosser, Wis.
C. R. Houke, Plymouth.
A. Shamouek, Wilber.
D. M. Johnson, Weeping Water.
F. H. Hanslem, Scribner.
C. E. Lind, Newman Grove.
R. S. Blakeman, Minden.
S. C. Oakes, Seward.
Jos. Rocke, Hallam.
Henry Veith, Lincoln.
W. J. Lehr, Elyria.
E. P. Lederman, Grand Island.
J. Cass Cornell, Ord.
C. K. Lawrence Hardware Co., Hastings.
A. A. & E. D. Lauson, Hastings.
Fred Peitz, Blue Hill.
W. H. Wisda, Lexington.
Ralph Wallace, Overton.
C. A. Strahle, Sargeant.
H. E. Isaman, Hastings.
H. T. Moore, Alma.
Frank Hacker, Friend.
J. H. McGrath, Hastings.
W. E. Simmons, Beaver City.
Chas. Shafer, Edison.
Anton Hansen, Upland.
Ernest Hoppe, Lincoln.
R. W. Bodinson, Kearney.
E. L. Jones, Omaha.
Theo. Sinhold, Omaha.
H. Henke, Jr., Grand Island.
Hayhert Gollaway Co., Loup City.
Krause & Son, Albion.
J. G. Cole, Roseland.
E. C. Wirth, Niobrara.
John Harst, Madison.
G. J. Smith, Auburn.
J. W. Bailey, Brook.
J. W. Vaught, Stella.
L. A. Peterson, Wayne.
P. L. Montgomery, Creighton.
Ray W. Weaverling, Peru.
P. J. Wright, Neligh.
C. O. Hale, Sprague.
A. I. Harper, Belden.
E. R. Hornel, Ulysses.
Wm. Patterson, Pleasant Dale.
J. C. Castle, Long Pine.
W. E. Brooks, Elgin.
M. J. Weidner, Lindsay.
M. M. Rothlectner, Columbus.
Sam Long, Superior.
W. W. Weaver, Norfolk.
Frank Ficturn, Wilber.
Lee Miller Hardware Co., Fremont.
G. L. Wolburg, West Point.
H. Holmquist Fried, Oakland.
J. S. Heine, Hooper.
O. A. Davis, Murray.
J. E. Cooley, Belgrade.
Erickson & Son, Stromsburg.
C. E. Seng, Clatonia.
Geo. A. Wachter, Pender.
H. Wm. Glovk, Eustis.
H. Schweitzer, Eustis.
F. A. Johnson, Burwell.
C. C. Howell, Fairbury.
A. J. Tool, Murdock.
G. E. Morehart, Red Cloud.
J. E. Axtell, Beaver City.
P. O. Reed, Loup City.
Thos. Jainrog, Aston.
Bartell & Siebolds, Dashler.
Geo. Patterson, Pilger.
Geo. Aubel, Lexington.
H. T. Mitchell, Orleans.
H. M. Thone, Blair.
Max Uhlig, Holdrege.
J. M. Babcock, Cumbrige.
O. L. Miller, Ravenna.
Geo. Scheer, Norfolk.
J. W. Goehert, Seward.
J. Haginlost, Giltner.
E. G. Gangistead, Decatur.
R. H. Kliene, Deshler.
A. M. Hansen, Fremont.
Ed. Lehnkuel, Wahoo.
B. H. McAllister, Grand Island.
R. E. Rosebery, Lexington.
Higbee Keyes, Callaway.
Kearney Hardware Co., Kearney.
M. Deifendorfer, Wood River.
W. L. Spear & Co., Geneva.
A. F. Bridthoner, Scotia.
H. Hansen.
C. H. Damme, Lorton.
J. C. Moore, Anselmo.
Nick Linden, Bellwood.
H. N. Town, Lincoln.

EXHIBITS AND EXHIBITORS.

ACME WHITE LEAD & COLOR WORKS, Detroit, Mich.: Represented By A. D. Hoag, B. A. Manning, G. E. Isaman and E. A. White. Souvenir, leather memorandum book.

AMERICAN STEEL & WIRE COMPANY, Chicago, Ill.: Woven Wire Corn Cribbing and Field Fencing. In charge of L. W. Garoutte and P. B. Garoutte.

AMERICAN WRINGER COMPANY, New York City: Represented by F. E. Rouse.

ART STOVE COMPANY, Detroit, Mich.: Represented by James H. Stirling. Souvenir, pencil and Hatchet.

E. C. ATKINS & CO., Indianapolis, Ind.: Saws. In charge of A. Munnich and T. F. Barbour. Souvenir, aluminum comb and stick pin.

ATMOSPHERIC WASHING MACHINE COMPANY, Aurora, Neb.: Represented by C. E. Neir, J. B. Hunter and J. O. Thomas.

BRIDGE & BEACH MFG. COMPANY, St. Louis, Mo.: Stoves and Ranges. Represented by Jno. Le Page, H. W. Hinkley and G. A. Axelson. Souvenir, combination pen and pencil.

BUCK'S STOVE & RANGE COMPANY, St. Louis, Mo.: In charge of Irvin Bertram and Adam H. Gauff.

COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio: Represented by J. A. Cassell. Souvenir, aluminum ink well.

COMSTOCK-CASTLE STOVE COMPANY, Quincy, Ill.: Represented by Philip Laughnane and N. B. Benewitz.

CRIBBEN & SEXTON COMPANY, Chicago, Ill.: Stoves, Ranges and Heaters. Represented by J. C. Bosworth and Mr. Purvis. Souvenir, memorandum book.

DENNING WIRE & FENCE COMPANY, Cedar Rapids, Iowa: In charge of B. P. Lewis.

DETROIT STOVE WORKS, Detroit, Mich.: In charge of G. W. Johnston, A. F. Burnett, and E. Roth. Souvenirs, Silver Plated Paper Cutter, Pocket Diary, Rules and Tape Measure.

DUNLAP MFG. COMPANY, Dunlap, Iowa: Hardware Specialties. Represented by H. Kellogg.

ESTATE OF P. D. BECKWITH, Dowagiac, Mich.: Stoves. In charge of I. G. Stiff and J. O. Sargent. Souvenir Stein and Stick Pin.

EXCELSIOR STOVE & MFG. COMPANY, Quincy, Ill.: Represented by H. Brown, J. W. Payton, and D. H. Lapp. Souvenir dating Stamp and Pencils.

FLECK MFG. COMPANY, Minneapolis, Minn.: Ball Bearing Washers. In charge of J. E. Fleck.

FULLER-WARREN COMPANY, Milwaukee, Wis.: Stoves and Ranges. In charge of Matt R. Bingham and G. C. Barney.

GEE WHIZ MFG. COMPANY, Des Moines, Iowa: Quick and Easy Washer. In charge of M. R. Davis and F. S. Rawley.

GEM CITY STOVE MFG. COMPANY, Quincy, Ill., and the MALLEABLE STEEL RANGE & MFG. COMPANY, South Bend, Ind.: German Heater and Malleable Steel Ranges. Souvenir Pocketbook.

GRISWOLD SEED COMPANY, Lincoln, Neb.: In charge of Q. A. Dungan and G. A. Chambers.

HERRICK REFRIGERATOR COMPANY, Waterloo, Iowa.: Represented by T. H. Smith and Mrs. Smith.

HOOVEN & ALLISON COMPANY, Xenia, Ohio: Binder Twine, Rope and commercial Twine. Represented by M. H. Gibbs.

JOLIET STOVE WORKS, Joliet, Ill.

KEITH FURNACE COMPANY, Des Moines, Iowa: In charge of R. S. Keith and Geo. E. Willsey.

LASHER MFG. COMPANY, Davenport, Iowa: Hardware Specialties. In charge of C. W. Lasher, Jr.

LEFEBVRE LEDGER COMPANY, Cedar Rapids, Iowa: Self-Indexing Ledger. Represented by F. A. Chidester and A. W. Ford.

LOUDEN MACHINERY COMPANY, Fairfield, Iowa: In charge of R. B. Louden and H. H. Moyer.

LOWE BROTHERS COMPANY, Dayton, Ohio: Paints and Varnishes. In charge of C. F. Belman.

MALLEABLE IRON RANGE COMPANY, Beaver Dam, Wis.: Represented by J. J. Troxell.

MARSHALL OIL COMPANY, Lincoln, Neb.: Improved Dipping Tank and Dipolene. Represented by F. W. Palmer.

MICHIGAN STOVE COMPANY, Detroit, Mich.: Represented by J. R. Burks, H. J. Knight. Souvenir, Leather Coin Purse.

MIDLAND GLASS & PAINT COMPANY, Omaha, Neb.: Lamp Shades, Mirrors, Varnish and Paints. Represented by J. G. Brown and Chas. R. Bauserman.

L. J. MUELLER FURNACE COMPANY, Milwaukee, Wis.: In charge of Lee Walters.

NATIONAL STOVE COMPANY DIVISION, STANDARD LIGHTING COMPANY DIVISION, OF AMERICAN STOVE COMPANY: In charge of H. B. Huffaker, D. E. Morgan, and E. L. Du Quette.

NEBRASKA HARDWARE CO., Lincoln, Neb.: Jobbers. Represented by W. E. Jakway, A. Crosby, G. Leach, J. M. Betts, G. G. Wellage.

NEBRASKA SEED COMPANY, Omaha, Neb.: Represented by J. G. Svacina and Martin Gress.

NEY MFG. COMPANY, Canton, Ohio: Haying Tools and Hardware Specialties. Represented by H. W. Anthony and L. Stern. Souvenir, Rubber Dating Stamp.

NICKEL PLATE STOVE POLISH COMPANY, Chicago, Ill.: In charge of J. W. Gill.

NORTHWESTERN BARB WIRE COMPANY, Sterling, Ill.: In charge of A. H. Dillon.

NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo.: Jobbers. In charge of F. E. Allyn, R. F. Corbyn, S. J. Garoutte. Souvenir, Diamond Edge Buttons.

OSMUNDSON SPADE MFG. COMPANY, Perry, Iowa: Tiling Spade and Animal Poke. In charge of Mr. Osmondson.

PATTERSON-SARGENT COMPANY, Cleveland, Ohio: Paints and Varnishes. In charge of W. W. Walton.

PERRY PLIER & TOOL COMPANY, Perry, Iowa: Represented by G. M. Mason.

PIKE MFG. COMPANY, Pike, N. H.: Scythe Stones, Razor Hones, &c. Represented by C. P. Snyder.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.: Made a special demonstration of their Blow Torch and nitric acid Brazing Apparatus and electric welded Fence. In charge of W. D. Ellsworth, assisted by salesman of the Wright Wilhelmy Company, Omaha.

PRITCHARD-STRONG COMPANY, Rochester, N. Y.: Elaborate display of lanterns. In charge of A. J. Brede.

RATHBONE, SARD & COMPANY, Aurora, Ill.: Stoves and Ranges. In charge of Walter H. Ross and W. R. Yendall, Jr.

REMINGTON ARMS COMPANY, UNION METALLIC CARTRIDGE COMPANY, New York. Represented by M. F. Sharp. Souvenir, Stick Pin.

RINGEN STOVE COMPANY, St. Louis, Mo.: In charge of E. L. McBride. Souvenir, Trick Match Box.

ROCHESTER STAMPING COMPANY, and ROBESON CUTLERY COMPANY, Rochester, N. Y. Cutlery and Stamped Ware. In charge of R. A. Henderson. Souvenir, Trick Match Case.

ROCK ISLAND STOVE COMPANY, Rock Island, Ill. Represented by S. R. Batson and F. W. Houck. Souvenir, Bill Book and Mirror.

RULLMAN-RULLMAN MFG. COMPANY, Hiawatha, Kan.: Wathena Washer. Represented by F. B. Rullman and A. Rullman.

ST. PAUL ROOFING, CORNICE & ORNAMENT COMPANY, St. Paul, Minn.: Metal Ceilings. In charge of N. V. Lux. Souvenir, Aluminum Coin.

SIMMONS HARDWARE COMPANY, and DYMOND-SIMMONS HARDWARE COMPANY, St. Louis, Mo., and Sioux City, Iowa: Jobbers. Represented by T. C. Dymond, F. J. Wachter, L. C. Booth, E. F. Jordan, J. A. Kemp, V. Noland, R. Shepherd and C. W. Edwards. Souvenir, Keen-Kutter Button and Streamer.

STANDARD VARNISH WORKS, Chicago, Ill.: In charge of Rubert Tewalt. Souvenir, Lead Pencil.

R. N. THOMAS, Shenandoah, Iowa: Husking Gloves, Hooks and Pegs. Represented by W. J. Staples.

UNITED STATES REGISTER COMPANY, Battle Creek, Mich.: In charge of L. Moblo.

VICTOR MFG. COMPANY, Leavenworth, Kan.: Wonder Washer and Wringer. Represented by F. J. Tallant, W. A. Thompson and E. V. Allen.

VOSS BROS. MFG. COMPANY, Davenport, Iowa: Washing Machines, Corn Cutter. Represented by W. H. Voss and A. Clifford. Souvenir, Glass Paper Weight, and set of water color Panels.

WAHLE FOUNDRY & MACHINE WORKS, Davenport, Ia.: Washing Machines. In charge of A. Nielsen. Souvenir, Snow Ball.

WAVERLY WOODENWARE COMPANY, St. Joseph, Mo.: Washing Machines. In charge of C. L. Faust.

WHITE LILY WASHER COMPANY, Davenport, Iowa: White Lily Washer and Gasoline Engine. Represented by T. H. Rosche and Lewis G. Martin. Souvenir, White Lily Inkwell.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Represented by Fred C. Whitney.

WISE FURNACE COMPANY, Akron, Ohio: Represented by W. G. Burks. Souvenir, Match Box.

FLAGG CUTLERY COMPANY.

THE FLAGG CUTLERY COMPANY, incorporated last fall, is now located at 90-92 West Broadway, New York. Regular and Safety Razors under foreign patents owned by the company are being manufactured, instead of importing the goods and paying customs duties as high as 75 per cent. and freight. These goods are being produced at the company's factory in Brooklyn from the same material and under the same processes employed in France, where the Razors are said to be famed for their superior quality. The patented Razor "Forever," one of the products, includes three high-grade, thin, interchangeable blades at the price of one fine quality regular Razor. This Razor is put up with 3, 5, 9, 12 or 24 blades, square or round point, wide or narrow blades. Extra blades can be furnished by dealers for such individuals as find it difficult to properly strop a Razor. James H. Flagg, president of the company, has been in the Cutlery business, both import and domestic, since 1865. Previous to incorporation the business was carried on under the name of James H. Flagg Cutlery Company, at 29 Murray street, New York.

PLUME & ATWOOD MFG. COMPANY.

THE PLUME & ATWOOD MFG. COMPANY, Waterbury, Conn., has just consolidated the New York and Chicago warehouses, with headquarters at 279 Broadway, near Chambers street, New York, where the entire third floor is occupied. Albert E. Snow, for many years the company's Chicago representative, is now in charge of the office in New York. The warehouse in Chicago has been discontinued, and new offices and salesrooms have been established at 508 Heyworth Building, corner Madison and Wabash avenues, Chicago. The company has also just obtained a new registered trademark, the "Snow Brand," for use in connection with free drilling brass Rod. The feature of this material is the economical results obtained when used in automatic machines. These rods are made according to a special formula, and, it is said, turn clean and true, save Drills and Taps, and make a clear stock free from blow holes. They are made in round, square and hexagon shapes, in all sizes from ⅛ in. to 2 in.

The J. C. Zinser Hardware Company, Joliet, Ill., has recently incorporated, with a capital stock of $10,000, to engage in the general Hardware, plumbing, steam fitting and sheet metal work business. The incorporators are J. C. Zinser, A. O. Fisher, R. T. Welsch and F. W. Themes.

H. W. JOHNS-MANVILLE COMPANY.

THE annual convention of the sales staff of H. W. Johns-Manville Company, manufacturer of Asbestos, Magnesia and Electrical Products, was recently held at the company's headquarters, 100 William street, New York. Representatives from all the factories and branch offices were present and the meetings were of great profit and interest. As a finale to the convention an elaborate banquet was held at the Waldorf-Astoria. The business of the company has been expanding at a rapid rate. It has factories at Brooklyn, N. Y., Milwaukee and West Milwaukee, Wis., and Hartford, Conn. Branch offices and warerooms have for some time been operated at Chicago, Milwaukee, Boston, Philadelphia, St. Louis, Pittsburgh, Cleveland, San Francisco, Los Angeles, Seattle, Kansas City and Minneapolis. Within the past few months new branches have been opened at New Orleans, Dallas and Baltimore, while business in Buffalo and vicinity has now reached such proportions as to necessitate headquarters there. This gives the company 16 branch houses throughout the United States, besides a large number of local representatives located at various points.

The new Buffalo branch is situated at 214 Main street and comprises a large retail store, offices and warerooms. It will be under the management of Geo. A. Schmidt, who for a number of years was connected with the Manville Covering Company, Milwaukee, which company is now a part of the H. W. Johns-Manville Company. Mr. Schmidt is well known throughout that section, having until recently been in charge of a special department of the W. A. Case & Sons Mfg. Company, Buffalo, who were the Buffalo agents of the H. W. Johns-Manville Company. B. F. Boscoe has been appointed assistant manager of this branch, and will make his headquarters in Rochester. Harry V. Patton will also be associated with the new Buffalo branch.

UNITED STATES HORSE SHOE COMPANY'S CANADIAN PLANT.

STOCKHOLDERS of the United States Horse Shoe Company, Erie, Pa., have recently incorporated under Canadian laws, as the Manitoba Rolling Mill Company, Limited, with a paid up capital of $100,000. They have purchased and will operate the Kirkwood Rolling Mills at Winnipeg, Man. The officers of the new company are L. A. McElroy, president and general manager; T. M. Kirkwood, vice-president; B. S. Fletcher, secretary, and J. S. Curtis, treasurer. The works are now equipped with one 9 in. Guide Mill, with five stands of housings, one 16 in. Bar Mill with three stands of housings, and the necessary heating furnaces, engines, shears, &c. It is the intention to materially enlarge the plant by adding a number of busheling furnaces, squeezer, shears, railroad spike machines and horse shoe machines, and engage in the manufacture of Bar Iron, Railroad Spikes and Horse Shoes, adding other commodities as trade conditions warrant. Contracts have already been placed for the additional equipment, and the company expects to have the plant in active operation within the next four months.

Kentucky Hardware and Stove Association.

THE seventh annual convention of the Kentucky Retail Hardware and Stove Association was held on February 5, 6 and 7, in the parlors of the Galt House, Louisville, Ky. The 24 hours previous to this date were stormy, and during the night considerable snow fell. This had some effect on the attendance during the opening session, as trains from all sections were delayed, thus preventing many from being present the first day. The second day's attendance, however, was very gratifying, and the enthusiasm manifested certainly reflected great credit upon the officers and members. Here at the home of the "blue grass" is fully realized the meaning of the word hospitality, and members of the association and other visitors were made to feel the warm welcome extended.

After the preliminary opening exercises, J. C. Frederick, Owensboro, on behalf of John W. Read, Hodginsville, presented the association with a beautiful gavel, made from wood grown on the farm where Abraham Lincoln was born. Mr. Frederick's words were well chosen and very apropos, paying as he did a glowing tribute of respect to the many attributes of the marytr President. Later on the gavel was presented to the retiring president of the association, U. S. Shacklett, Fulton, as a token of appreciation of his able administration.

Mr. Corey's Address.

M. L. Corey, Argos, Ind., secretary of the National Retail Hardware Association, was present, and addressed the association on penny postage vs. parcels post. Mr. Corey's address was in part as follows:

I believe you will admit that whatever service the Government renders its people should be charged back to them on an equal basis as in proportion to its cost and benefits. One hundred and one million pounds or 13 per cent. of the total weight of mail carried consists of letters and postal cards and pays 78 per cent. of the entire postal revenue of $106,860,000. Four hundred and ninety-one million pounds or 66 per cent. of the balance pays only 4 per cent., or $5,697,000. One thousand business letters will weigh about 12 lb., and it takes $20 in stamps to send them. Twelve pounds of cheap mail order papers pay just 12 cents for the same service. The 12 lb. of letters pay the Government $18 profit. The 12-lb. of newspapers lose the Government 75 cents. Here is discrimination for you with a capital D. No wonder the second-class matter has increased from 40,000,000 lb. in 1875 to over 663,000,000 lb. in 1905. A large part of this increase has been in the cheap mail order class of publications, all of them persistent advocates of catalogue house buying and now demanding a cheap parcels post. These two threatening evils are most closely connected. Given cheap delivery for their advertising columns, they now need cheap delivery of the goods, so that their mail order patrons can have greater advantage over the established local retail merchants.

It costs less than ¼-cent each to carry our letters and postals. We are a nation of letter writers. Every person would benefit by penny postage. It seems no further argument is necessary to prove we are entitled to it and should receive it.

TWO THINGS ARE IN THE WAY.

Parcels post advocates don't want it, and there is already a deficit in the postal department. The parcels post advocates say: "Give us low rates for carrying merchandise and this business will be so increased that the shortage will disappear." They have gone to the farmer and apparently succeeded in capturing the National Grange influence. This organization, at their last convention, voted $10,000 toward securing a parcels post, and to-day they have three of their leaders in Washington as a lobby and they are passing resolutions in almost every convention indorsing the measure.

We find very few who understand anything whatever about it, yet to our lawmakers at Washington it appears there is a howling demand for the bill. It is a hard question for the business man to combat, for these farms papers are doing all in their power to show we oppose the measure for selfish reasons. They continually claim that all the opposition really comes from the express companies, notwithstanding the fact that to our knowledge these companies have never made a move in opposition.

THE FARMER HAS HEARD BUT ONE SIDE OF THE QUESTION.

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The large daily papers—many of them are against us. To combat this we have the daily press of thousands of smaller cities and towns, and the country weeklies, who are our friends, whose interests are linked closely with ours. The trouble with them is that they are not awake to the gravity of the situation. They do not fully understand the measure nor what effect it would have upon the business of the country at large.

Postmaster-General Cortelyou advocates the consolidation of third and fourth class matter, which he says really means a limited parcels post, the effect being to reduce the present rate for carrying merchandise to 8 cents a pound, or just one-half the present rate. He says there is no doubt that there is a strong sentiment favoring the measure, although vigorous opposition comes

JOHN W. READ.

U. S. SHACKLETT.

from village merchants, who fear that the mail order houses would get advantage.

GO AFTER YOUR CONGRESSMAN.

Representative Overstreet, who is chairman of the House Committee on Post Offices, is not in favor of adopting the parcels post system in this country. It is his strong, clear headed opposition that has proved a barrier that the parcels post crowd have not been able to overcome. We have many other friends in Congress, but many are wavering and the time is not far distant when we will have to exert every influence in our power if we defeat this measure. I would urge you to write to your Congressman. If you have already done this, do not hesitate to do so again, asking him if there are any new developments; also if the parcels post advocates are in Washington working for the bill. Let him know that you are alive and that the retail merchants of Kentucky expect him to protect their interests against Chicago catalogue houses. Talk to your local editors and see that your newspapers have something in them to counteract the influence of the cheap mail order publications.

The great trouble with us is that we are liable to shirk our own individual part in this matter and trust to our association officers to do all the work. This is a cause where the responsibility must rest in your own hands. We can sound the alarm, but you must answer the call or the fight will go against us.

The following resolution was adopted:

Resolved, That each member of this association write a personal letter to the Congressman representing his district, urging upon him the importance of defeating the proposed parcels post bill and endeavor to secure his support in their behalf.

President Shacklett's Address.

President Shacklett followed with his annual address, in which he congratulated the members upon the steady growth of the association, at the same time making some very pertinent suggestions as to its future development. We quote from Mr. Shacklett's remarks as follows:

Another busy year has passed since our meeting at the Galt House in March, 1906. History will record 1906 as being one of the busiest years of this great industrial Commonwealth. Prosperity, according to Secretary Shaw's view, has gone beyond the comprehension of the American business man, which is making us an extravagant people to the extent that factories are being built continually all over this country to make every conceivable article of merchandise, and Hardware specialties as well, and the Hardwareman must be up and doing to be able to meet the growing demands of the country, as well as to protect our own interests. This year of 1907 the commercial man must drive his business instead of letting it drive him. The very question that has been uppermost in our association work, the great octopus, the catalogue house, has been driving us with a high hand, until now we are awake we must take the reins in our own hands.

I am glad to note the willingness to aid us that some manufacturers and jobbers show. It will be by their help and their help alone that we win. I do not blame some manufacturers as well as some jobbers for being slow in committing themselves to this work. It is a cautious proposition, as we see from the suit pending between the South Dakota Merchants' Association and Montgomery Ward & Co., which was begun in order to hinder association progress. On this account I believe in caution at all times.

RETAIL GENERAL CATALOGUE.

I have only a few words in regard to the proposed publication of a general catalogue by the National Association. I believe that it would be an experiment, in the first place, and in the second place I do not believe it would be practical for all parts of the country to price the same, as each section of the country has to adjust its business largely according to its surroundings, and the catalogue houses do not affect all parts of the country alike. I believe it would be best for each individual to have his own catalogue priced, yet that would be almost impossible.

LEGISLATION SUGGESTED.

If it is not out of place at this time I would like to urge upon the association the necessity of our taking some action during the next session of our Legislature in regard to our collections laws and the extremely high license on Firearms. If this be not class legislation it would be impossible to get up a bill on that order. One of the objects of this association is to help each other in such way that we shall be better able to get honest business and gain honest profits. Such a course as this will infringe upon the rights of no one and I think we should be wideawake to allow no such infringements on our own rights if we can by a clear, statesmanlike way lead our law makers to see matters as we do.

DRIVE YOUR BUSINESS.

The work of this body is no child's play. We have already accomplished much, and we must by sheer force of will accomplish much more. New occasions teach new duties, and we must be watchful to meet the demands of an enterprising people. I would urge upon you, "drive your business," and when discouragements come those of you who are sufficiently optimistic will "screw your

J. E. GRUBBS.

GEO. CUBBAGE.

courage to the sticking place" and will not fail. I was glad to note the interest taken by our body at our last meeting and I hope you have kept up that enthusiasm and are still in the harness. It is that co-operation of interests that makes a good president, and not the man himself. One man can do little, but when he receives the cordial support of others it inspires him to push forward the work and try to do more.

Report of Secretary.

After this followed the report of Secretary J. R. Sower, who is one of the wideawake, energetic young men of this Commonwealth, and who is, in a great measure, responsible for the present status of the association. Mr. Sower's report was as follows, in part:

In presenting my annual report this year I come with more courage than at any previous convention. Things have gone pleasantly this year, there have been few complaints, and I take it you have all prospered; we have added new members, and some of the old ones have come

back, which show that we are going steadily forward. Kentuckians are slow, but once they decide a thing is right they never let go until they have reached success, and that our association is a success there is not the slightest doubt. Those whom we have called on for assistance have come forward, seemingly glad to be identified with us. The jobbers and manufacturers have shown themselves our friends. Many of them have been untiring in their efforts to make this convention interesting and profitable to us, and I hope every one of you will be true to those who have helped us.

I am glad to notice that our merchants are taking advantage of fire insurance with the association, something which every one of us should avail ourselves of.

Wm. R. Belknap's Address.

The first order of business as outlined by the programme for the second day's session was an address on the "Hardware Store," by Wm. R. Belknap, president of

JNO. R. SOWER.

A. STEITLER, JR.

the Belknap Hardware & Mfg. Company, Louisville, which was certainly replete with practical suggestions, showing a thorough knowledge of the trade in all its details. Mr. Belknap spoke, in part, as follows:

The scope of the typical Hardware store has expanded almost indefinitely of late years. It used to be confined, or was understood so to be, to a stock of the coarser products of the foundry and machine shop, the forge and the grindstone; bnt now in means almost anything, aside from eatables, which recommends itself to the comfort and convenience of mankind. From Sad Irons and Sash Weights the expanse has been gradual to Baby Carriages, Rocking Chairs, Hammocks and Lap Robes, as full of soft suggestions as a two-minute boiled egg.

TAKE A LOOK THROUGH ANY HARDWARE CATALOGUE

of a modern house and you will find there a bewildering variety of those things which make for the lightening of labor of the man in the workshop, the cook in the kitchen, the lady in the dining room and parlor. In so far as the people who dispense this line of goods, as wholesalers or retailers, have had high ideals of their duty to the public, and endeavor to carry them out by exhibiting and encouraging the use of labor saving appliances and economical utensils and tools, just so far have they been of benefit to their communities in their day and generation. These higher ideals are fostered by associations like your own in this State, like those in other States, in the combined associations, and in the combined national organizations. These cannot afford to go on record except as standing for what is best, and as the whole can only be elevated by its constituent members, each one has felt his whole responsibility to carry the good work forward.

THE HARDWARE STORE AND HOW TO KEEP IT.

It should be a model of order and neatness, swept, dusted and arranged for convenience and for the proper display and suggestion of the use of improved implements and utensils. The only flies should be those who are engaged by the "tanglefoot" sheet in the window; while the bright, inviting look which highly polished Edge Tools and the Gilded Bird Cages give should rival the jeweler's window across the street. There should be nothing suggestive of wornout, rusted or second rate goods. All should be new and attractive, and in order to give those in the house the proper respect for the goods they should be so displayed or kept in clean, whole packages, accurately assorted as to kind and size, and lined up every day of the week.

WE CANNOT HAVE THE BEST ORDER

and desirable results unless those whom we employ have the right feeling of loyalty and interest themselves in the business. This can be inspired by those of us who feel that we have had the experience and are willing, patiently and persistently, to pay off the debt which our advantages have given us. We cannot expect the green boy from the crossroads or hillside to come into our stores or offices and know at once how to handle goods or to realize the difference between blued and bright Screws; between Shoe Tacks and Hungarian Nails; but we can so place him and help him that he shall know all these things better than we do in the course of a year or two. Nothing is so pleasant and grateful to an employer as the feeling that the dependence which he places is not misplaced among his own people.

PROPRIETOR'S RESPONSIBILITY.

This brings us up to the responsibility of the proprietor himself. He may not be far advanced in years, but to the young people he is "the old man" of the institution. If his ideals are not high, if his standards are not lofty, he can hardly expect the best from those who look to him as an example of success. There is where our main responsibility comes in. If we are going to leave our mark for the better, we must show it in our every day life, and cultivate a general kindly feeling for our fellow men, young or old, customers or employees, from the smallest office boy up to the trusted cashier.

These things are old, trite truths. I do not bring in new stories out of the 1907 almanac or even out of the columns of the weekly papers. I assume that these are readily within your reach, but have taken advantage of the opportunity you gave me to restate some of the old fundamental truths which I feel to be at the bottom of business and character as reflected in our business life, in the sincere hope that we will, each of us, develop and realize the highest and best powers with which the Almighty has endowed us.

George D. Wright's Address.

The thoughtful address of Geo. D. Wright of Hibbard, Spencer, Bartlett & Co., Chicago, who had for his subject, "Business Success and How to Obtain Same," was listened to with close attention. Mr. Wright spoke as follows, in part:

As the qualities necessary to succeed are so varied, it is impossible for any one man to possess all of them: therefore our success can be measured by our ability to generate original ideas, to analyze another's ideas, adapt them to our requirements, not simply indorse what another man does or says, for where he would succeed possibly you would fail, or *vice versa*. The great ware-

B. T. DURHAM.

J. C. FREDERICK.

house of the future is filled with unknown possibilities and success is a question of drawing out or developing latent powers.

There is a wealth of undeveloped faculties and powers locked up in every normal human being, and to make our existence a positive element we must turn on to the wires of our business the current of thought, let it run into every detail of our business and analyze every feature of it.

To succeed in this age of activity and keen competition in all lines of business we have forced upon us increased demands and requirements to keep pace with the times and draw from commercialism that which contributes to success.

"CAN DO" ARE TWO SMALL WORDS,

but they form a magic phrase that opens the door of hope toward success if we will but have faith and go forth on a conservative basis and filled with a determination. One reason some men do not accomplish more is because they do not attempt more for, "according to your faith, so be it done unto you." Faith in self is born of knowl-

edge of the possession of certain qualities; faith in self is inspiring and uplifting, and the man without this quality is to a certain extent handicapped. A mistake is frequently the basis or foundation of success, but we should profit by our experience by analysis in a systematic way of the condition.

ANOTHER GREAT FACTOR IS ENTHUSIASM,

for commercially speaking about the "deadest man" is one without enthusiasm; it is hard to cultivate, but a "sure winner" when you have it, and is a power like a mighty magnet influencing everything that it touches. I do not refer to spasmodic, but habitual, enthusiasm, as it will assist you to overcome difficulties. You may make a few mistakes, but the man possessed of persistent, positive, perpetual enthusiasm has a wonderful influence, has a broader field of action, accomplishes more than the man who never attempts anything new. I do not intend to say enthusiasm is foolish, but there is more hope for a fool than the man who has no faith in himself or is without enthusiasm.

THE SELLING SIDE.

To me in selling lies the most fascinating practical feature of a business, as it is here that knowledge or real knowing crystalizes into art, and from which the fruits of our science in business is realized, and unless properly sold you have no profits, therefore, selling is the motive power of our business.

I will not undertake to tell you how you should sell or set up and conduct a model Hardware store; as each of you no doubt are doing business under different circumstances you cannot be treated on the same basis, but if you will study this question of selling from its various points of view you will find you can increase your business and profits through your sales more than you can by trying to save money in buying.

Adopt the plan of the catalogue houses of going direct to the trade around you with your advertising matter. The demand for a very large percentage of the sales of the catalogue houses is created simply by placing in the hands of the consumer a catalogue full of pictures, descriptions and principally net prices.

There are furnished by certain jobbers free of charge net priced circulars on seasonable goods to be distributed to your trade and a catalogue for your regular business, with such prices that enable you to increase your business, not by increasing your stock, but by making sales on such goods you do not carry in stock, and instead of telling one you do not carry it tell him you can get it in a few days, and quote him a price, whereby you save the order from a catalogue house and frequently make other sales and win a new customer.

NEW IDEAS.

We must put forth and foster new ideas and new schemes for the control and advancement of our business and keep at home the trade that is going away from us, not so much on account of the invader having the advantage, as the fact we do not put forth our efforts to keep it at home by using our natural advantages or position on the race track of commercialism, and if we do not do this we must take the consequences as the sins of omission, and it will be as Carlyle has truthfully said, "The race of life has become intense; the runners are treading on each other's heels; woe be to the man who stops to tie his shoestrings."

The difference between a successful and an unsuccessful merchant is that one improves his business year by year by taking advantage of all that modern times afford, the other keeps it where it is, and it keeps him where he is—considerably behind the times and frequently dropping back, perhaps slowly, but surely.

SYSTEM.

You should have system, which is the keynote of a successful business, and to a practical degree it is flexible, and just as a backbone is in this respect the essential feature of the man's physical construction, so system is the backbone of business. Neither man nor business can get along successfully without backbone, and the better the physical backbone the better the man, the better the business backbone or system the more successful will be your enterprise.

The word system is not half so formidable as it sounds; it is simply the difference between looking for something you can't find and having everything around your place in proper order. System is a way and a place for everything and everything in its place, but a business with a place for nothing and nothing in its place is seldom successful.

In your business you should have system in buying and selling, rules for store management, rules for keeping up your stock, your store clean and attractive.

YOU SHOULD HAVE PERSONALITY,

for this, if you will think of it, is a feature in every business proposition and in a measure contributes to your success. You should have that positive quality, that central magnetic essence of true manhood, the natural product of which is a drawing power, a business getting power necessary to success, and it is a standard or guide in your business worthy of all acceptance. You should study those with whom you come in contact and appropriate to your own good the good qualities of personality found in others, and by having made the study you will find that much of the success of others is also available to yourself.

SALESMEN.

Your selling force acts either as a dividend payer or dividend destroyer, the latter very frequently by lack of proficiency. Nearly every salesman, whether behind the counter or as a commercial traveler, has some fault, but the prevalent cause of failure is his inability to make in such a manner as will appeal to the purchaser a logical presentation of the salient selling features of the article he is trying to sell.

Here is where the education of your salesman is necessary. Give him every opportunity to learn from the traveling salesman and the letters from the source of your supplies all he can about the goods you are buying.

It requires more to sell certain goods than lay them upon the counter or to say this is a good Padlock for 25 cents; this is also worth the money, but if you can tell your customer this one has more tumblers, a heavier staple, a steel case, &c., you give him some facts that appeal to his reason, and in many cases you can sell a better article and one with more profit to you than if you would simply state the price and allow him to select, for in many cases he would take the cheaper article, with less profit to you and get less satisfaction from the use of the item bought.

COMPETITION

is something that does and ever shall exist, and well enough that it does, but it is a commercial problem we both collectively and individually should endeavor to solve, both by mutual agreement through the good offices of this association and by applying individually our local conditions to place this conflict, which is suicidal to our profits, on a higher plane, but each of us should hold ourselves responsible in a measure for these circumstances, and until we place upon our own shoulders all the blame justly due us we cannot alleviate the pressure upon our profit accounts from the source of competition. There is no one other trade condition that throttles our profit account or deserve more careful attention than does this commercial weapon.

We should remember by overcoming our adversaries we grow strong and achieve success that can be had in no other way, but at the same time competition should be based on ethical principle, and we should not forget if it were not for competition our achievements would not be so great.

Competition does not mean that you or I should go out of business or that your competition with your neighbor Hardware dealer should be of a vindictive nature, but to the contrary, we should in our business dealings and as far as possible apply the Golden Rule, and instead of having to watch the other fellow so closely you will have more time to watch your own business enprise.

THE STRESS OF COMPETITION

often leads to business animosities, and you have often heard the expression, "We will put him out of business," which is the most foolish and extravagant idea in which a man can indulge, and by cutting to put the cutter out of business it usually transpires that the aggressor is the one who suffers the most.

The business man who harbors this kind of a grudge unconsciously gives more time to watching the other fellow's business and "doing him up" than he does in building up his own, and no man can afford to nourish a business animosity of this kind, as it will surely lead him into the extremes of competition and ultimately sap the vitality of his own business enterprise; therefore, do not decry your fellow merchant, but strive to increase your profits and uplift the cause of the retail business.

It is a question sometimes whether it is expedient to let the cutter, who apparently is not disposed to get a fair price for his goods, have the business at prices you know to be unprofitable or to undertake to meet him in a like measure, cut for cut, even though it is a loss to you; but, as you well know, continuous price cutting beyond a legitimate profit only portends bankruptcy; therefore, you and the retail Hardware business in general will be benefited by letting him reel out of his line, for the end will come, and it will not be How long? but you will be surprised to see how soon.

IF YOU HAVE A COMPETITOR

with a price cutting disposition you cannot afford to establish a competitive warfare, for while you may under-

sell him on something or on some item in question, he will act like a boomerang and come back at you, and thereby you both will have suffered.

There are a great many ways to overcome this. Do not indulge in price cutting yourself; fight the other fellow by pushing your business and by the sale of your goods through salesmanship, for in this you have the secret or science of the whole problem, not the art, for art is doing, and science is knowing, and learn the fundamental principles of logic from a sales standpoint, for in the marketing of our goods is our profit.

By encouraging friendly feeling between retailers; by deciding to have a legitimate profit, and by the diversion of trade into the proper channels you make less keen the competition and increase your profits, and usually you will find the better the profits and the more prosperous the merchant the better man he is.

"The Lord Helps Those Who Help Themselves"

was the subject of an address by F. J. Semple, vice-president of Simmons Hardware Company, St. Louis. We make the following extracts from Mr. Semple's speech:

A very prominent clergyman once said, "I use my text only as a hook to hang my thoughts upon," and my text to-day is, "The Lord Helps Those Who Help Themselves."

Experience and observation have convinced me that this world is built on the laws of compensation—that we all get just about what is coming to us. We hear a great deal about this man being lucky and that man being unlucky, and while at first sight it does seem as if the one carried a rabbit's foot and the other a hoodoo, yet if you simmer it down and look into it carefully you will find that certain things happen to a man simply because it is natural that they should happen; that he is lucky because he has ambition, determination and energy, because he is farsighted and has perseverance, and that the other is unlucky because he is lazy—"follows the lines of the least resistance"—and is inclined to sit down and wish for things rather than to go out and hustle for them. We cannot hope to get anything in the world worth having without paying the price for it.

IF WE WANT ANYTHING IN THIS WORLD

and are willing to sit up nights and work for it—concentrate our mind on it—scheme and hustle—we are liable to get it, provided we do not ask for the moon or the world with a Barbed Wire Fence around it. It is only the Trusts in these days that get the impossible things, and even they seem to have a hard time to hold them.

If there is anything that needs to be impressed upon the retail Hardware dealer at the present time it is that they should help themselves by becoming more intelligent in the conduct of their business—by learning the value of their time—by trying to make their time profitable to the highest degree. Never was competition so strong as it is to-day; we have it from without and within; both at home and abroad, in the sense that catalogue houses give us a great deal of competition.

GOING AFTER THE CATALOGUE PEOPLE.

To my mind there is nothing easier than to meet catalogue house competition, but it requires personal effort, personal touch and extreme watchfulness. If I were doing a retail Hardware business and there was a party within my reach who ordered goods from a catalogue house I would try to find out what he bought, I would take from my stock something similar but better in quality, I would take it to him, no matter what the cost in the way of time or trouble, and show him mine; show him why it is better; appeal to his loyalty to patronize home industry, and I would offer it to him very cheap, doing all I could to dissatisfy him with his catalogue house purchase. This can be done very easily, because it won't cost you anything to offer your goods cheap, and if perhaps he should take you up and buy, let him have it cheerfully; take it just as you would a dose of nauseous medicine—that is to say, lick the spoon after you have taken it and look pleasant.

EDUCATE THE CLERKS.

The old saying that "Goods well bought are half sold" is entirely obsolete; it takes salesmanship to sell goods and salesmanship is now classed as a science or profession. I believe merchants should encourage traveling salesmen to give pointers to their clerks as to how to sell goods and how to sell those that are most profitable. It is far better that your clerk should make $1 for 15 min. of his time, which it takes to sell a Hand Saw on the average, than it is to make 50 cents selling some other kind of a Saw, which does not pay as good a profit. The selling end of a retail business is where the profit is made, and for this reason every merchant should be exceedingly careful to improve in as far as he can the selling ability of his clerks.

GENEROSITY IN BUSINESS

properly displayed and conservatively used, is an exceedingly valuable asset. For instance, keep some cheap Pocket Knives (that don't cost you over 10 cents apiece) to give to the little boy who comes in with his mother—make him happy, and in doing that you make the mother happy. Do not be afraid of hanging up a one dollar bill to take down a two dollar bill. I believe in buying a few cheap goods, but not selling them—they are good things to keep but never to sell. I believe in selling the highest grade goods possible, because they are the cheapest in the long run, and because you do your customers a service by persuading them to buy the very best on the ground that the best is always the cheapest.

FAIR SEX SHOULD BE CATERED TO.

One of the prominent members of our organization has recently, in a public way, stated that he believes in catering to the trade of the women—that inasmuch as 80 per cent. of all the money that is spent in stores in this country is spent by the women—it isn't wise for us to build up our stores to cater to only 20 per cent. of the money spending part of the community—which is the men.

It is astonishing how many Housefurnishing Goods or goods that appeal to women can be bought for $100 when they are bought in small lots and well assorted. Great success can be achieved by doing this, provided you are willing to sell them at department store prices, but if you intend to put higher prices on them and let the department stores sell them cheaper than you do you better never touch them—they will simply do you harm.

CHILDREN'S WANTS.

I strongly recommend that greater attention be paid to the wants of children. If I had a retail Hardware store I would keep Marbles, Tops, Baseball Goods, Fishing Tackle, &c.—cater to the trade of the boys—and I would sell them at about cost on the theory that boys soon grow to be men. Get them into the habit of coming into your store while they are young, and they will stick to it when they grow to manhood.

ATTRACTIVE SHOW WINDOWS.

One of the best ways to draw both women and children to your stores is by having very attractive show windows. Display your goods in such a way that when people stop and look at them they will feel drawn into the store. I don't believe a retail dealer could use any other advertising medium to much better advantage than he could his show windows, provided he has in his employ a man who has ingenuity enough to get up displays that are novel and striking—ones that attract attention to the extent of having people talk about them.

I believe that advertising is in the air to-day—it has come to stay. Look what it is doing all over the country. The magazines and other periodicals give more than two-thirds of their space to advertising. The daily papers look more like an advertising sheet than a newspaper. There are millions upon millions of dollars spent in this way every year. The best evidence that it pays is that it is continued.

DON'T FORGET THAT COMMERCIAL LIFE TO-DAY

is, in a sense, war, so fierce is the competition and so strenuous is the life of the merchant of this era—and the man who buys his stock of goods and simply sits down and waits for the customers to come in will inevitably get left. I believe that in these days a man gets what he goes after if he goes after it right; and if he doesn't go after anything he won't get anything. The merchants of the present time must be up and doing.

Paint As a Hardware Line.

Two interesting papers on the subject of Paint were read. One of these under the title, "Paint and Its Importance to the Hardware Merchant," was presented by C. C. Pulver of Heath & Milligan Mfg. Company, Chicago. The other paper was entitled, "Good Paint and Results," and was read by T. A. Harmon of Hanna Paint Company, Columbus, Ohio. Both papers were of a practical and instructive character and were listened to with close attention.

Other Addresses.

The "Vacation of a Hardwareman" was the subject of a very interesting and entertaining address by J. C. Frederick, Owensboro, an ex-president of the association. "The Evils of Improper Legislation" was the title of a paper in which an able discussion of the subject was presented by B. J. Durham, Danville. J. S. Ogden, delegate to the national convention held in Chicago last

year, made a very lucid and entertaining report of the proceedings of that body.

Entertainment.

A complimentary dinner was tendered a number of the members of the association on Wednesday by John W. Price, vice-president of the Belknap Hardware & Mfg. Company, Louisville. The annual banquet of the association was also held the same evening in the spacious dining room of the Galt House, covers being laid for 125. Col. Morris B. Belknap, of the Belknap Hardware & Mfg. Company, made a most efficient toastmaster. A number of speeches were made, both by representative citizens of Louisville and also by the visiting Hardwaremen. The cigars for the occasion were furnished by the White Lily Washing Machine Company, Toledo, Ohio. A beautiful souvenir, consisting of a Blue Grass Hatchet, miniature Whet Stone and pocketbook, was presented by the Belknap Company.

Election of Officers.

The following officers were elected to serve for the ensuing year:

PRESIDENT, John W. Read, Hodginsville.
FIRST VICE-PRESIDENT, J. E. Grubbs, Winchester.
SECOND VICE-PRESIDENT, Geo. Cubbage, Leitchfield.
SECRETARY, John R. Sower, Frankfort.
TREASURER, A. Steitler, Jr., Owensboro.

DELEGATES TO THE NATIONAL MEETING, to be held in Boston in June: J. R. Sower and B. J. Durham; alternates, J. R. Read and J. Kirchdorfer.

The compensation of Secretary J. R. Sower was materially increased, in order to allow for clerk hire, the duties of the office having grown to such proportions during the past year as to preclude all possibility of one man's handling it.

Resolutions.

The Committee on Resolutions made the following report:

Whereas, It is both fitting and proper that this association in convention assembled should express its appreciation and approbation to those who have contributed their time, labor and ability to make this meeting the splendid success that it has been; therefore be it

Resolved, That the Kentucky Retail Hardware and Stove Association hereby tenders to U. S. Shacklett its sincerest thanks and deepest gratitude for the untiring efforts and efficient service he has rendered us in building up this association and elevating it to the high plane that it now occupies, and we can only repay him by acknowledging his works and with grateful hearts assure him of our loyalty, devotion and support in further increasing the glory of this association.

That in like manner our thanks are due to Jno. R. Sower, the efficient secretary of this association, for the unflagging industry and fervent enthusiasm displayed in the affairs of his office. It seems superfluous to call attention to his success, the results are so apparent. But we wish to go on record as acknowledging our satisfaction and gratitude for the devotion he has given to the arduous labors of his office.

That we thank most sincerely the National Committee for sending to us the National Secretary, M. L. Corey, who by his wise counsel, timely suggestions and varied experience helped to make our meeting the more profitable and entertaining.

That we regret the inability of our National ex-President, W. D. Bogardus, to be with us, and trust to be favored with his presence upon some future occasion.

That we also express our thanks to the Executive Committee for the beautiful souvenir programme issued, for the perfect arrangements made for our personal comfort and the expediting of business, and for the able speakers secured for our meetings, for the complimentary theatre party and for the most elegant and pleasant banquet that was tendered the association and its guests.

That we especially tender our thanks to Col. Morris B. Belknap, the accomplished toastmaster, and to the Hon. E. J. McDermott and Hon. J. J. Fitzgerald for their delightful, entertaining and instructive addresses which added so much to the pleasure of the evening's entertainment.

That we appreciate the compliment of the invitation of the Commercial Club of this city to attend their meeting and banquet, and also for the courtesy shown our special committee.

That we acknowledge with pleasure the visit of Mr. Lindsley, the courteous and affable representative of *The Iron Age*, and desire, through him, to express to his paper our appreciation of the services of *The Iron Age* in behalf of the retail Hardware associations of the country.

That we also desire to thank the daily press of this city for its attention and very complete reports of our meeting they have given us, and the managers of the Galt House for their uniform courtesy and their efforts to make our meeting comfortable and pleasant.

Last, but by no means least, we wish to thank both collectively and individually the several manufacturers and jobbers who have made exhibits and sent their representatives to this convention, thereby adding to its attractiveness, pleasure, profit and success.

And to the traveling men, our warmest friends, efficient advertisers and best fellows on earth generally, we wish to give not alone our thanks, not only our acknowledgments, but our sincere love, good will and personal friendship, hoping they may sell more goods than ever, have less trouble in the future and never die, but be transported to the Elysian Fields in an airship.

Members Present.

The attendance of the members was as follows:

J. S. Ogden, Ashland.
John W. Wilkins, Bandana.
E. S. Farrell & Son, Buffalo.
F. G. Jenkins, Cynthiana.
Grayson-Wallace Hardware Co., Central City.
Mersman Hardware Co., Covington.
H. Willis & Son, Correyville.
Earle Head, Clarkson.
Scott & Durham, Danville.
J. Koenigstein, Eminence.
E. C. Harris, Eminence.
P. C. Sower & Co., Frankfort.
F. G. Stagg, Frankfort.
Shacklett-Thomas Hardware Co., Fulton.
Geo. H. Watts, Georgetown.
Donaldson & Clark, Georgetown.
Fletcher Hardware Co., Georgetown.
Allen Clark Peters & Co., Georgetown.
Norris & Lockett, Henderson.
Mattan & Co., Harrodsburg.
F. C. Parish, Horse Cave.
Jno. W. Read, Hodgensville.
Leitchfield Mercantile Co., Leitchfield.
T. J. Turley & Co., Leitchfield.
People's Hardware & Furn. Co., Leitchfield.
Johnston & Caskey, Lebanon.
T. B. Hay & Co., Lexington.
Vandever Hardware Co., Lexington.
E. G. Hartick, Louisville.
Fred. Schietinger, Louisville.
L. P. Harpering, Louisville.
Dehler Bros., Louisville.
Chas. B. Schott, Louisville.
Jas. Knapp & Co., Louisville.
J. H. Murphy, Louisville.
Gehr & Low, Louisville.
J. C. Kirchdorfer, Louisville.
J. H. Farley, Louisville.
Albrecht & Heick, Louisville.
Wm. Hinkle, Louisville.
Paul Wagner, Louisville.
Geo. Dehler, Jr., Louisville.
W. H. Unversaw, Louisville.
M. W. I. Young, Louisville.
Chas. Staeuble, Louisville.
Weider Bros., Louisville.
Rubel Hardware Co., Lebanon.
Mount & Elkins, Lancaster.
Haseldon Bros., Lancaster.
Mahan & McAfee, Lawrenceburg.
D. C. Hagerman Hardware Co., Lawrenceburg.
F. M. Ware, McKinney.
Walker & Scott, Morganfield.
Clayton Bros., Morehead.
McClanahan & Shea, Maysville.
Lochridge & Ridgeway, Mayfield.
A. B. Beale & Son, Murray.
Prewitt & Howell, Mt. Sterling.
Chenault & O'Rea, Mt. Sterling.
C. E. Owens, Madisonville.
Von Gunnigan & Simpson, Nicholasville.
W. J. Fischer, Newport.
M. J. Gordon, Olive Hill.
Leo. Laub & Son, Owensboro.
J. C. Frederick, Owensboro.
A. Steitler, Jr., Owensboro.
E. L. & A. T. Byron, Owingsville.
Lowry & Talbott, Paris.
J. B. Benjamin, Providence.
G. N. Wassenboehr, Paintsville.
P. J. Honaker, Port Royal.
Connor & Co., Russellville.
Geo. B. Simpson, Sturgis.
J. M. Stone & Co., Sturgis.
Elliott & Pettus, Somerset.
Girdler Bros., Somerset.
Judy & Bascom, Sharpsburg.
Owen & More, Shelbyville.
Goodman Bros. & Co., Shelbyville.
McElroy & Schults, Springfield.
Hayden & Barber, Springfield.
W. P. Ray, Stithton.
W. P. Lancaster, Versailles.
Geo. B. Minary, Versailles.
Berry & Daugherty, Versailles.
J. H. Cooper & Bro., Vine Grove.
Owen Hulett, Williamstown.
Grubbs & Benton, Winchester.

Exhibitors.

Manufacturing and jobbing interests were represented as follows:

ACME WHITE LEAD & COLOR WORKS, Detroit, Mich.: Represented by D. H. Hart and P. C. Frayser.

ADRIAN WIRE FENCE COMPANY, Adrian, Mich.: Represented by T. M. Carr and J. B. Young.

ATKINS, E. C. & Co., Indianapolis, Ind.: Saws. Represented by J. O. Tate.

AMERICAN STEEL & WIRE COMPANY, Chicago: Represented by S. R. Cassidy.

BELKNAP HARDWARE & MFG. COMPANY, Louisville, Ky.: Jobbers. Represented by B. F. Cook, Jr., Chas. M. Summers, T. A. Harmon and J. H. Sandell.

BRIDGE & BEACH MFG. COMPANY, St. Louis, Mo.: Stoves and Ranges. Represented by J. W. Hackney.

HIBBARD, SPENCER, BARTLETT & Co., Chicago, Ill.: Jobbers. Represented by Geo. T. Wright, J. L. Malin and F. M. Kerr.

HEATH & MILLIGAN MFG. COMPANY, Chicago, Ill.: Paints, Oils, Varnishes, &c. Represented by C. C. Pulver.

INDIANAPOLIS SADDLERY COMPANY, Indianapolis, Ind.: Represented by John T. Shont and M. M. Glasgow.

INDEPENDENT WHIP COMPANY, Indianapolis, Ind.; Represented by John T. Shont and M. M. Glasgow.

MALLEABLE STEEL RANGE COMPANY, South Bend, Ind.: Represented by H. H. Douglas and Chas. E. Curran.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa. Electrically welded Field Fencing. Represented by A. P. Shirley and John E. Wade.

E. G. SCHUTTE & Co., Cincinnati, Ohio: Ice Tongs, Picks, Shavers, Saws, Scales and Cold Chisels. Represented by E. G. Schutte.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: Jobbers. F. J. Semple, C. H. Castlen, W. B. Mills, Marc Antony, W. C. Doherty, O. H. Worch, F. J. Steiner and W. G. Osborn.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Represented by A. M. Ruter.

Wisconsin Retail Hardware Association.

IF the presence of many members, manifestation of hearty enthusiasm, display of earnest interest and an unshaken spirit of aggressiveness in pursuit of definite results, are to be recognized as conducive to prosperous activity in deliberative bodies, then assuredly the eleventh annual convention of the Wisconsin Retail Hardware Association, held at Milwaukee, February 6, 7 and 8, was, measured by these standards, one of the most successful gatherings in the history of this notably vigorous organization. Out of a membership which, with recent accessions, now totals not less than 625, more than one-half were present, and a large majority of these were in attendance at each of the single daily sessions, which were held in the auditorium of the new Public Service

J. KORNELY.

EMIL TEITGEN.

Building—a splendid edifice recently completed, of which the city of Milwaukee is justly proud.

No afternoon sessions were provided in the programme, thus affording members ample time and opportunity to visit the exhibits which were displayed in spacious halls on the fourth floor of the same building. There were in all more than 85 exhibits shown, many of which were prepared and arranged with elaborate care, and the entire display commanded a marked degree of attention from the crowds of visitors who daily thronged the exhibition halls.

Questions heretofore prominent at previous conventions, such as Parcels Post, and Catalogue House Competition, were again subjects of discussion, but it was evident from reports made and expressions given that during the past year, distinctive gains have been made in combatting these and other adverse influences regarded as detrimental to the interests of Hardware merchants. Due to the helpful effects of organized effort thus graphically demonstrated by practical results accomplished, fully 70 per cent. of the Hardware merchants of Wisconsin have applied for, and been taken into, membership of the association, and the proportion is steadily increasing year by year.

Not the least of the benefits accrued to members of this body is the cheap but sound insurance afforded by its Mutual Company, which, in view of its successful management and growth, was able to increase its premium dividend rate from 33 1-3 to 40 per cent., which action was authorized by the Executive Committee at its recent meeting.

Opening Session.

After calling the meeting to order at the opening session on Wednesday morning, President Emil Teitgen of Manitowoc, introduced Milwaukee's vigorous young Mayor, S. M. Becker, who in a characteristic and fitting speech, combining sentiments of friendly greeting with instructive data of Milwaukee's industrial progress, extended to the convention, individually and collectively, a most hearty welcome. In the course of his remarks, the Mayor stated that the yearly production of Milwaukee's iron, steel and machinery industries, amounts to over $47,000,000, and employs more than 10,000 men, while the total output of the breweries—an industry upon which the city's fame is popularly supposed to rest—aggregates but $26,000,000, and furnishes employment to only about 4000 men.

President's Annual Address.

The president, after an appropriate response, delivered his annual address, which included a general review of the past year's work, and presented a number of important recommendations for consideration relative to matters touching the future welfare of the association. He spoke in part as follows:

Regarding the past year, we have increased in membership, importance and influence. Our National Association has the confidence of the jobbers and the manufacturers. Our Joint Committee of Retailers and Jobbers and our Catalogue House Committee have done a great deal of good for the Hardware trade of our entire country, and are continually working in our interests. They deserve due appreciation from this body for their time and services, all of which they furnish gratuitously for the good of the cause.

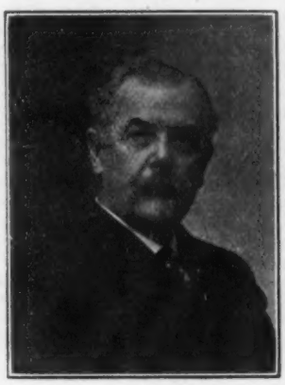
BUT AS THE YEARS ROLL BY WE ARE CONFRONTED

by new conditions and problems which must be met and solved, many of them of such magnitude that the individual cannot cope with them, and which can be brought to a successful issue only through associated effort. Herein lies the strength of our association, but this strength and benefit—the measure of it—depends entirely on the loyalty of our members, perfect concert of effort, unbroken unity, going hand in hand in all our business relations, down even to the most unimportant item we purchase. This in time will bring the best results to our members, and translated into French this would mean "We must together sticken, each by each, and we will get there."

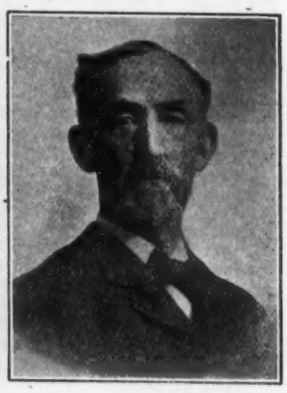
Men in all branches associate themselves into bodies for the purpose of mutual protection, and where this is done for the general good, as well as individual advancement, the purpose is laudible and successful. We should not relax our efforts to confine the distribution of Hardware and kindred goods to the retail Hardware trade and not allow it to be diverted into other channels to be made leaders of.

BUSINESS MEN INSTEAD OF LAWYERS.

I would recommend that more stringent efforts should be made that we may be more largely represented in the



JAMES MURPHY.



C. A. PECK.

legislative affairs of this country by men of commercial training instead of legal training. To-day our law making bodies are too largely composed of men in the legal profession, and naturally the laws that appeal to them are the ones by which they profit most. We want more laws that apply to us for the same reason.

I would further recommend that some attention be given the matter of transportation, to the end that we may have some rate reform, and more particularly improvement in service. Delays in transit have become a serious proposition to us all. I have had Stoves on the way this past fall 11 weeks, and when they came they were rusted so that I could not accept them. The company will not take them back and the railroad company

will not pay for them. Some remedy should be devised, as it is a matter of importance.

LOCAL ORGANIZATIONS.

I would further recommend—and I would urge this—that more persistent efforts should be made toward the organization of local associations in cities and towns; the perfection of the idea that we are in business for a living and not to kill off our competitors; the building up of a spirit of friendliness and good will toward our competitors; a willingness to join hands and help one another. Instead of destroying, we would thus broaden our views, and broaden our business as well as our life and affairs at home. Life is but short and we should make the best of it.

One of the very important and most direct benefits that our association offers its members is our mutual fire insurance, which is positively safe. Our company

O. B. JAMES.

O. P. SCHLAFER.

is founded upon correct and sound business principles. It is managed by safe and conservative business men—as good as we have anywhere in the world—and it is furnished to you at cost.

Convention Committees.

At the conclusion of the president's address Secretary Peck announced the list of committees prepared by the Executive Committee, as follows:

TRANSPORTATION: E. H. Ramm, New London; R. Puchner, Wittenberg.
AUDITING: J. C. Lewis, Antigo; William Rothsaeck, Manitowoc.
PRESS: J. L. McNamara, Janesville; I. B. Wensink, Plymouth.
RESOLUTIONS: O. A. La Budde, Oconto; Mr. Murdock, Murdock & Jones, Union Grove.
QUESTION BOX: J. Murphy, Racine; Fred Herrenbruck, Milwaukee.
LEGISLATIVE: L. M. Nash, Grand Rapids; E. A. Dewey, Kenosha; A. Heins, Tigerton; C. Pflugardt, Milwaukee.
GRIEVANCES: O. P. Schlafer, Appleton City; J. Montgomery, Warsau; L. Findeisen, Green Bay; J. W. Jones, Racine.
SERGEANT-AT-ARMS: A. Schupinsky, Milwaukee.

Mr. Peck's Report.

The annual report of Secretary-Treasurer C. A. Peck, Berlin, was filled with a cheering array of facts and figures, which furnished indisputable evidence of the association's satisfactory growth and achievement, and was presented with the enthusiastic interest that characterizes this official's untiring efforts for the advancement of the general welfare of the organization. It was received by the convention with expressions of warm approval. Extracts from the report are given as follows:

One year ago I reported 531 members, 32 of which have in the meantime either gone out of business, sold out, or dropped their membership. We have taken in 119 new members, so that to-day (January 19) we number 618 members upon our rolls. Complaints have been few and far between, and so far as I know have been satisfactorily adjusted.

On February 26 of last year I mailed 325 petitions to Senator Spooner protesting against the passage of the Parcels Post bill, then pending, and twice since than I have circularized the State—viz., June 1 and October 16. On January 1 of this year I mailed 998 copies of our present programme.

In regard to dues, there were on March 5 164 in arrears, which by July 5 was whittled down to 27. I then made drafts on these and 24 of them were paid.

My work for the insurance company has brought me in close contact with many of our members all the way from Sturgeon Bay to Kenosha, and I have enjoyed meeting them on their own stamping grounds. Our insurance report shows that 10 of our members suffered to a greater or lesser extent by fire, and I think one or two losers who were not insured with us should be added to our number. I have made 18 trips to different parts of the State and have taken in many new members largely because of the benefits offered by our fire insurance company. That we have made a great success of this feature is not so much due to your secretary's efforts as to your own hearty co-operation. When I tell you that I wrote over $120,000 in January and have on file in our office $36,000 more to write at this time, I think you will agree with me that our work has not been entirely in vain. I confidently expect to pass the two million mark the present year, but that will depend very largely upon you.

Financial Statement.

The association's financial exhibit as shown in the treasurer's report represents a measure of prosperity that bespeaks both good management and substantial co-operation on the part of the membership. With all liabilities liquidated, including salaries, expense and National Association dues for 1906, there remains in the treasury a surplus of $2215.92. It is estimated that this sum will be augmented by approximately $1000 from dues and other sources received at the meeting just held.

Invitations.

Immediately following the opening of the Thursday morning session, Secretary Peck announced that on behalf of the Hardware merchants and manufacturers of Milwaukee, he desired to extend an invitation to all delegates to attend a theatrical performance in the evening at the Alhambra Theater, complimentary tickets for which were being distributed in the cloak room.

A similar invitation extended by the Schlitz Brewing Company to visit its plant in the afternoon was also announced, and cabs provided by the company were held in waiting at the Republican House to take the visiting members and their ladies out to the brewery.

The Hardwareman's Advertising.

The address of O. B. James, Richland Center, on the subject of advertising proved a very practical, instructive and original presentation of this much talked of subject. His talk was illustrated by a series of advertising models, designs and copies, most of which he had successfully used in his own business. He was followed closely in his remarks by his auditors, many of whom

HENRY WERNECKE.

O. A. LA BUDDE.

doubtless gathered valuable pointers that will be of future use in advertising their goods. Mr. James spoke in part as follows:

What is advertising? To the retailer it is that science of publicity which will bring prospective purchasers into his store. This is accomplished by handling a good line of goods at right prices, honest and courteous treatment of your customers, the proper display of goods, and the judicious use of printers' ink. In most of these elements of success you are adepts or you would not be here to-day. It is in the last mentioned, the judicious use of printers' ink, where many of us fall down. It is the printer and the brain behind the printer that has made the catalogue house what it is to-day. We have both the brain and access to the ink. Why not use them? Let us make a study of newspaper publicity. Emulate what is good in the catalogue house advertisements and

eradicate that which is bad. Read the best that we find treating on the subject, but not accepting as gospel all that is written.

PRICES BY ALL MEANS.

I noticed in *Printer's Ink* of November 28 an excellent article in which appeared this statement: "The moment you begin to talk price, you take the reader's mind off what he is going to receive and center his attention on what he is going to give for it." This is a beautiful psychological theory, but does it apply to the retailer? Doesn't the retailer want to appeal to a man's pocketbook? What more direct route will you find to his heart?

What would our big department store advertisements amount to if they did not advertise prices? What is it that the bargain seeker first looks for? Price. A priced ad. is the only ad. that will sell goods. The price quoted and the text of an advertisement are its most important features. In composing the text avoid mentioning too many good points of the article in the same ad., as you would avoid mentioning too many articles. The reader is apt to become confused. Better mention one article at a time—its principal point of superiority—and let your arguments emphasize that one point. This, of course, would not apply to advertisements of special sales, or holiday advertisements, in which you wish to mention several items. In that case have each article ruled off by itself, making the appearance of distinct and separate advertisements. There might, too, be an objection to quoting prices, at least specific prices, on holiday goods. A prospective purchaser might prefer to choose an article the value of which was not generally known, especially to the recipient of the gift.

PRICE COMPARISONS.

Catalogue houses in their advertisements compare their prices with those of the regular dealer, exaggerating the difference. Why then, when we get hold of an article that we can sell cheaper than they, would it be wrong for us to compare prices to their disadvantage? Nor would we be liable, as long as we stick to the truth, to call Sears, Roebuck or Montgomery Ward by their names. Neither do I think it an unwise plan to burlesque their advertisements occasionally—make them appear ridiculous by copying their style.

NATURAL VIEW OF THE READER.

In wording your advertisement try to make your introduction coincide with the natural view of the reader—they will more readily believe your final statement. If you start your ad. with a question, let it be one that can be answered in the affirmative only. For instance, suppose you are advertising a Furnace and start it in this manner: "Do you want a cold house? Do you want your plants and vegetables to freeze? If not buy a Blank Furnace of Jones & Co." An advertisement of this style is repellent. Better word it like this: "Do you want a warm, cosy home, with plants and vegetables safe from frost? If so buy a Blank Furnace from Jones & Co." Would not one fall in quicker with the spirit of an ad. like the latter?

UPPER RIGHT HAND CORNER ON FIRST PAGE.

The first thing of importance after selecting the paper or papers in which you wish to advertise is the proper selection of space. Now, the best space obtainable in a country newspaper is the upper right hand corner. In the large cities, however, that space is not for sale, though it can be had in most of the country papers. The reason that this space is the best is because the paper is folded with that page out. This page is always out, and it is always laid down with the upper right hand corner up. The news dealer places it with that page up because it is always upon that portion of the page that the name of the paper appears, also its date.

ONE THING AT A TIME.

I think it is advisable as a rule to advertise one thing at a time, and to advertise it in several ways; that is, have that one article in your display and then refer to it in the local news. When you make a contract with the publisher for this space it is a good idea to have the privilege of using 6 to 12 lines local space each week. If you are advertising a Steel Range, for instance, have the local notices read something like this:

> Mr. John Johnson, a prominent citizen of the town of Clyde, was in town last Saturday after one of those famous Ranges sold by Jones & Co.

Farmers like to see their names in print, and a notice like this each week helps wonderfully.

ODD FIGURES.

It is a good idea to use cuts where possible, because a cut often tells more than you could express in many words. Odd figures are favored by many in advertising prices. Catalogue houses and department stores commonly price in odd figures. The object of this practice is generally misunderstood. Eight dollars and ninety-seven cents does not look much smaller to a man of intelligence; it does, however, give the appearance of close figuring. A man looking at a price of $9.88 or $9.97 might reason that the dealer is figuring very close or he would not get down to odd pennies.

WRITE SOMETHING WORTH READING.

In conclusion, there is one thing I wish to emphasize, and that is that people are reading advertisements; you do yourself. You pick up a magazine and you find the advertisements in these magazines almost as interesting as the reading matter. We must meet the readers half way; we must write something worth reading.

Mr. Schlafer on Mutual Fire Insurance.

O. P. Schlafer, president of the Wisconsin Hardware Dealers' Mutual Fire Insurance Company, in a short address called the attention of members to the remarkable growth the company had enjoyed and the sound financial basis upon which it now rests. Starting three years ago with the smallest minimum of business permitted under the State laws, the company now has policies in force of nearly $1,250,000. Despite the exceptionally large losses of last year, which aggregated $7600, the stockholders at their last meeting were able to pass a resolution under which 40 per cent. will be returnable on all policies expiring during the year 1907. Over $100,000 additional insurance was pledged at this meeting.

Greetings.

Telegrams conveying friendly greetings and congratulations to the association were read by Secretary Peck from R. R. Williams, Hardware editor of *The Iron Age*, and from the secretaries of the Kentucky and Nebraska Retail Hardware Associations in session, the former at Louisville and the latter at Omaha. On motion these messages were suitably acknowledged.

Stove Salesmanship.

A paper on "Stove Salesmanship" was read by Henry Wernecke, Manitowoc, Wis., in which he emphasized the necessity of a salesman having a perfect knowledge of his line and ability to demonstrate his goods in an effective way. Extracts from this paper are given, as follows:

My idea of a good salesman is a person who thoroughly understands the construction and workings of the Stove he tries to sell. It is not at all impressive for a salesman in presenting a Range to his customer to open the oven door and say "This Range sells for $45," and then stand by his customer with nothing more to say.

THE FIRST THING A SALESMAN OUGHT TO DO

when a customer inquires for a Stove is to find out what kind of Stove and grade of stock he desires, about what price he intends to pay, whether he wants a steel or cast Range; also to discover if possible the disposition of his customer and thus judge how to treat him. He should then lead the customer to the grade of Stove he is looking for and carefully dissect it by showing its structure in detail, noting especially the points in which it is superior to others. By showing up even minor points, though they are general to all Stoves, the salesman will thus gain the confidence of his customer, make him feel that he knows something about Stoves, and will in most cases effect the sale.

A STOVE OUGHT TO APPEAR

as it will in the kitchen or parlor. If possible line the Ranges along the wall and attach a length of pipe with an elbow to it, giving it the appearance it will have when connected to a chimney. A dealer, I think, should carry one complete line of a first-class Stove in which he thoroughly confides, instead of having a mixed stock of high grade goods. There is nothing more embarrassing than to have two or more Stoves of the same grade on the same floor and have the customer ask you, "Which Stove do you confidentially believe to be the best?" To be fair to the manufacturer he must say "They are all good," instead of explaining each one in detail and showing up its superior parts.

KEEPING A RECORD OF STOVE SALES

is, I find, profitable, because it enables you to refer a prospective buyer to his neighbor for information. He who thoroughly understands his Stove and is able to impart this knowledge to his customer is a first-class Stove salesman.

M. L. Corey's Address.

M. L. Corey, secretary of the National Association, having just arrived from attendance at the Kentucky Hardware dealers' convention, held at Louisville, was introduced, and made a brief address. After expressing satisfaction with the forward strides made by the Wisconsin Association, and his high appreciation of its unwavering support of the national body, Mr. Corey engaged in a discussion of topics which are now the subject of serious consideration of both the national and local organizations. In a cursory review of the situation he noted the successful issue of recent litigation, which involved the character and scope of action permissible under the law to such associated bodies and the individuals composing their membership. While pointing out that such results are in themselves both encouraging and gratifying he warned his hearers that campaigns are not often successfully terminated with the victory of a single battle, and instead of relaxing effort such successes should act as a spur to further work and vigilance.

Binder Twine Manufacture by Convicts.

Mr. Nash, Grand Rapids, addressed the convention on the subject of the manufacture of Binder Twine by convicts in the State Penitentiary. He expressed himself as favoring legislation providing for such manufacture, and recommended that where such bills were introduced members of the Retail Hardware Association should use their influence to secure their passage, and co-operate with the Implement Dealers' Association to that end.

Mr. Fink speaking on the same subject took the ground that such employment of penitentiary convicts was desirable, not only for economic reasons, but also from a humanitarian standpoint, as the confinement of prisoners in idleness is the refinement of cruelty in punishment.

New Officers.

The election of officers for the ensuing year resulted in the unanimous choice of the following officers:

PRESIDENT, J. Kornely, Milwaukee.

VICE-PRESIDENT, James Murphy, Racine.

SECRETARY-TREASURER, C. A. Peck, Berlin.

O. A. La Budde, Oconto, and O. B. James, Richland Center, were elected members of the Executive Committee to fill the vacancies of the expired terms of James Murphy and H. Krueger.

After the question of choice of delegates to attend the next national convention had been disposed of by the selection of the president and secretary to attend that meeting a vote of thanks was tendered the retiring officers of the association.

Resolutions.

The Committee on Resolutions recommended the following, which were adopted:

Resolved, That this association tender a vote of thanks to the Merchants' and Manufacturers' Association for their kind entertainment on the evening of Thursday, February 7.

Resolved, That we appreciate the courtesy of the press of the city, and especially the helpfulness of the trade papers to us as an association.

Resolved, That the National Association could not do better than select Milwaukee for their next meeting place.

Whereas, It is represented that the railroads enforce the rule of charging demurrage after an expiration of 48 hours, and that said railroads do not guarantee service of deliveries at a specified time; therefore, be it

Resolved, That it is the sentiment of this association that a rule or law binding only one of the parties is unjust, and that we believe demurrage charges are just, and also believe that the railroads should pay to, or rebate, us for not delivering goods within a reasonable time. We are in hearty sympathy with the National Association in its efforts to adjust this inequality, and we request our Congressmen to favor any legislation in securing a remedy for said unjust ruling.

Resolved, That the Wisconsin Retail Hardware Association in convention assembled at Milwaukee, this 8th day of February, 1907, through their secretary ask our Senators and Assemblymen to pass the new garnishment bill now before them, lowering the amount of exemption to $25, for the reason that in our opinion it will benefit the honest workingman and will more effectually help to reduce our so-called "dead beat" accounts.

Exhibits and Exhibitors.

E. C. ATKINS & Co., Indianapolis, Ind.: Saws. Represented by W. E. Stalnaker, A. A. Teel, Robt. Eveland, A. F. Haas. Souvenir, watch fob, Hand Saw stick pin.

AMERICAN STEEL & WIRE COMPANY, Chicago, Ill.: Woven Wire Fence department. Represented by E. J. Smith, Grant Phillips, Louis Harter.

ART STOVE COMPANY, Chicago, Ill.: Represented by J. Frank Knight, C. R. Clago, B. R. Ahrendt, E. J. Hahn. Souvenir, pencil and pen holder and small Hatchet.

ATLANTIC STAMPING COMPANY, Rochester, N. Y.: Represented by Adolph W. Walter. C. H. Vosburgh, sales manager. Souvenir, Tub.

AUTOMATIC DAMPER COMPANY, Milwaukee, Wis.: Represented by A. B. Ferdinand, W. Mueller. Souvenir, Ball Bearing Pulley.

AMERICAN FORK & HOE COMPANY, Cleveland, Ohio: Represented by W. G. Pancoast.

AMERICAN VAPOR STOVE COMPANY, Detroit, Mich.: Represented by J. H. Cox.

BRAND STOVE COMPANY, Milwaukee, Wis.: Represented by P. G. Meyer, M. J. Franay. Souvenir, lead pencil and mirror.

BAXTER STOVE COMPANY, Mansfield, Ohio: Represented by M. F. Stellwagen, S. A. Stellwagen, Geo. Schirngle. Souvenir, puzzle card, booklet on "Beating Catalog Competition."

BARTH BROS. MFG. COMPANY, Port Washington, Wis.: Furniture and Woodenware. Represented by J. B. Thill.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Represented by H. L. Davis and staff. Souvenir, Carborundum Knife Sharpener, pin and match holders.

CRIBBEN & SEXTON COMPANY, Chicago, Ill.: Stoves. Souvenir, Memorandum book.

CROW STOVE POLISH COMPANY, Milwaukee, Wis.: Represented by H. C. Bomhart. Souvenir, sample of Stove Polish.

COMSTOCK-CASTLE STOVE COMPANY, Chicago, Ill.: Represented by F. McCabe, J. H. Bannon, E. H. Castle.

CORDES HEATING SUPPLY COMPANY, Milwaukee, Wis.: Represented by Geo. B. Carr, Robert Cordes, Fred R. Cordes, H. A. McIntyre. Souvenir, aluminum card case and cards.

GEO. M. CLARK & Co., Chicago, Ill.: Stoves and Ranges. Represented by George H. Proetz, C. B. Martin. Souvenir, key ring and wrench.

CONSOLIDATED SHEET METAL WORKS, Milwaukee, Wis.: Represented by Fred Vogenberger.

CREAM CITY ROOFING & PAINT MFG. COMPANY, Milwaukee, Wis.

COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio: Represented by B. Ketchum, R. S. Hickey. Souvenir, Presto pickaninnie.

DIEHL NOVELTY COMPANY, Sheboygan, Wis.: Represented by Jacob Diehl.

DETROIT STOVE WORKS, Detroit, Mich.: Represented by C. F. Daniels, L. E. Swane, A. F. Bernett, G. W. Johnson, W. A. Owen. Souvenir, paper cutter.

ECLIPSE STOVE COMPANY, Mansfield, Ohio: Represented by A. D. Meyer.

ESTATE STOVE COMPANY, Hamilton, Ohio: Represented by W. W. Strayer. Souvenir, nickel base glass ink stand.

EASY WASHING MACHINE COMPANY, St. Marys, Ohio: Represented by Jacob King, James Stewart.

FULLER-WARREN COMPANY, Milwaukee, Wis.: Stoves and Ranges. Represented by Harlan S. Crane, J. C. Hood, J. S. Potter, C. W. Jones. Souvenir, card case.

WM. FRANKFURTH HARDWARE COMPANY, Milwaukee, Wis.: Jobbers. Represented by L. Frankfurth. Souvenir, leather card case.

FRAMELESS WINDOW SCREEN COMPANY, Blanchardville, Wis.: Window Screens. Represented by M. M. Erdsmore.

GREEN BAY CORNICE & CORRUGATING COMPANY, Green Bay, Wis.: Represented by J. B. Macomber.

GEM CITY STOVE COMPANY, Dayton, Ohio: Represented by A. D. Meyer.

HAWKEYE INCUBATOR COMPANY, Newton, Iowa: Represented by T. Payne, F. H. Bergman.

HOME PRIDE RANGE COMPANY, Marion, Ind.: Represented by W. L. Nesbitt. Souvenir, nickel base glass ink stand.

IOWA DAIRY SEPARATOR COMPANY, Minneapolis, Minn.: Represented by R. A. Ford, A. H. Steake.

JEWETT & Co., Buffalo, N. Y.: Stoves and Ranges. Represented by J. W. Hall, F. Henunbruck. Souvenir, watch charm and mirror.

KOCH & LOEBER COMPANY, New York City: Souvenir, stick pin.

LYONS SPECIALTY COMPANY, Lyons, Ohio: Barn Door and Latch Holder. Represented by Wm. Petersen.

A. J. LINDEMAN & HOVERSON COMPANY, Milwaukee, Wis.: Represented by C. M. Zweck, Peter Jonas.

LOWE BROTHERS COMPANY, Dayton, Ohio: Paint and Varnish. Represented by C. S. Ashbrook, H. R. Harries. Souvenir, fob and stick pin.

LENNOX FURNACE COMPANY, Marshalltown, Iowa: Represented by J. M. Bush, C. M. Pratt, E. P. Miller. Souvenir, mirrors and memorandum book.

MORLEY-MURPHY HARDWARE COMPANY, Green Bay, Wis.: Jobbers. Represented by W. E. Meusel.

MOORE BROS. COMPANY, Joliet, Ill.: Ranges and Heaters. Represented by Harry A. Smith, T. M. Sayman. Souvenir, magazine match box.

JOHN McVOY & Co., Chicago, Ill.: Jobbers. Represented by H. H. Wherry.

MILWAUKEE CORRUGATING COMPANY, Milwaukee, Wis.: Represented by J. Moran.

MILWAUKEE SPECIALTY COMPANY, Milwaukee, Wis.: Represented by W. M. Quirk.

MILWAUKEE ARTISTIC METAL CEILING COMPANY, Milwaukee, Wis.: Represented by Chas. H. Koebs, A. W. Shaw. Souvenir, ash tray.

L. J. MUELLER FURNACE COMPANY, Milwaukee, Wis.: Represented by Nate B. Garnsey, J. H. Benney.

MALLEABLE IRON RANGE COMPANY, Beaver Dam, Wis.: Represented by F. W. Rogers, J. L. Layhe. Souvenir, spoon and button.

MALLEABLE STEEL RANGE COMPANY, South Bend, Ind.: Represented by J. F. Weiss. Souvenir, watch charm.

NEY MFG. COMPANY, Canton, Ohio: Represented by Charles I. Domer. Souvenir, dater and tin tray.

OHIO VARNISH COMPANY, Cleveland, Ohio: Represented by W. H. Angell. Souvenir, sample cans.

ONEIDA COMMUNITY, LIMITED, Oneida, N. Y.: Represented by Frank H. Primo, J. C. Gibson. Souvenir, historical booklet.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.: Represented by E. C. Burdick, E. D. James. Souvenir, nail puzzle, pocket dictionary.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: Represented by H. W. Cadwallader. Souvenir, button.

PENINSULAR PAINT & VARNISH COMPANY, LIMITED, Detroit, Mich.: Represented by B. H. Coddington. Souvenir, half pint can Peninsular Lac Stain.

PENINSULAR STOVE COMPANY, Detroit, Mich.: Represented by John O. Lamb. Souvenir, pocketbook.

PARAGON MFG. COMPANY, Chicago, Ill.: Washing Machines. Souvenir, calendar.

JAS. E. PATTON COMPANY, Milwaukee, Wis.: Paint. Souvenir, tin bank.

C. A. PECK HARDWARE & MFG. COMPANY, Berlin, Wis.: Represented by Fred R. Peck.

PATEK BROS., Milwaukee, Wis.: Paints and Colors. Represented by T. J. Dousseron, M. Longfellow, Mr. Ross, Mr. Parker. Souvenir, ash tray.

JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee, Wis.: Jobbers. Represented by Wm. Poeppenhausen, Julius Marschalk, Fred Wetzel.

QUAKER CITY RUBBER COMPANY, Chicago, Ill.: Represented by John B. Frey. Souvenir, flowers for ladies.

ROBERT ROM COMPANY, Milwaukee, Wis.: Steam, Gas and Mill Supplies. Represented by G. E. Crippen.

JACOB RETTERER, Chicago, Ill.: Stoves, Ranges and Furnaces. Represented by Wm. O. Retterer. Souvenir, Glenwood Range.

RAPID HEATER COMPANY, Grand Rapids, Mich.: Instantaneous Bath Heaters. Represented by W. J. Loomis.

ROBINSON FURNACE COMPANY, Rockford, Ill.: Represented by W. H. Bliss.

REPUBLIC METALWARE COMPANY, Buffalo, N. Y.: Represented by Jas. E. Harper, Mrs. Anwerter. Souvenir, paper knife and rule.

STOVE DEALERS' SUPPLY COMPANY, Milwaukee, Wis.: Represented by Ferd. Gassmann. Souvenir, watch fob.

STOWELL MFG. & FOUNDRY COMPANY, S. Milwaukee, Wis.: Registers, Hay Tools, &c. Represented by R. A. Nourse, M. J. Evans, Rob. Moscrip. Souvenir, time indicator and mirror.

SIMONDS MFG. COMPANY, Chicago, Ill.: Saws. Represented by W. J. Feddery, J. Van Dyke, Jr. Souvenir, lead pencil and sharpener.

STANDARD VARNISH WORKS, Chicago, Ill.: Represented by H. W. Love. Souvenir, pencil.

SCHILL BROS. COMPANY, Crestline, Ohio: Represented by M. F. Stellwagen, S. A. Stellwagen, Geo. Schwingle. Souvenir, pocket mirror.

ST. PAUL ROOFING, CORNICE & ORNAMENT COMPANY, St. Paul, Minn.: Represented by Ivan A. Campbell. Souvenir, aluminum pocket piece and mirror.

SMITH PAINT & VARNISH COMPANY, Milwaukee, Wis.: Represented by A. Benz, J. W. Altenberg, C. Richards. Souvenir, memorandum book, pencil.

UNITED STATES REGISTER COMPANY, LIMITED, Battle Creek, Mich.: Represented by A. O. Jones. Souvenir, booklet.

UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn.: Represented by H. R. Patterson. Souvenir, stick pins.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: Represented by F. H. Bush. Souvenir, postal card.

VOSS BROS. MFG. COMPANY, Davenport, Iowa: Washing Machines. Represented by Chas. D. Fick. Souvenir, paper weight.

WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: Snowball Washing Machine. Represented by Herman H. Wahle. Souvenir, poster.

WHITE LILY WASHER COMPANY, Toledo, Ohio: Represented by A. F. Victor, Sam T. White. Souvenir, miniature ink stand.

WIXSON BROS. COMPANY, Milwaukee, Wis.: Paint and Hardware Specialties. Represented by R. J. Waddell, W. W. Wixson.

WISCONSIN FOUNDRY & STEEL WORKS, Cedar Grove, Wis.: Represented by Robert Koeppe, P. Stokdyk.

WHITE MOP WRINGER COMPANY, Fultonville, N. Y.: Represented by F. S. Porter.

WASHINGTON CUTLERY COMPANY, Watertown, Wis.: Represented by Chas. Lehrkind.

OHIO STOVE PIPE & MFG. COMPANY, New Philadelphia, Ohio, announces that it is getting out an attractive catalogue covering its entire line. It will be ready about March 1, at which time the company will mail copies to those in the trade from whom requests are received.

Correspondence.

THE HARDWAREMAN'S ADVERTISING.

To the Editor:—At the Missouri Retail Hardware Association's Convention at Kansas City, January 17 and 18, R. H. Myers is reported to have said:

> I am against fake advertising. It is a common thing with us in the larger cities, and no doubt to some extent in the smaller ones, that when some church affair or social entertainment is to be gotten up with a programme they seek to raise money by filling it with advertising. From among your customers a representative is selected to call on you at your store and ask for a $5 or $10 advertisement. This became so troublesome and annoying that when our local Retail Merchants' Association was formed it was one of the first matters taken up. We at once passed a resolution that was signed by every house except one or two, and we finally succeeded in getting them in, that no advertisement of any kind in the shape of programme or other special advertising outside of the regular newspapers and journals should be allowed. To our surprise and gratification we found that it worked like a charm. When called upon by scheme advertising solicitors we would show them a printed notice stating that we were prohibited under penalty of a fine from placing advertisements except through regular established newspapers and journals. I think I am safe in saying that this action resulted in a saving to us of $500 a year formerly spent for advertising that was never of any practical advantage to us, and which acting individually we could not turn down without incurring the displeasure of our customers. It worked so well for us that I feel it can be used advantageously in towns large and small if you can get merchants to stick together on it.

Last year at the South Dakota Convention, M. L. Corey advised the members not to indulge in this waste of money by advertising in baseball programmes, church fair programmes, &c.

The Missouri State Association condemned this practice and advised their members to "turn it down," and in the next breath, offer thanks as follows:

> We desire to thank the manufacturers and jobbers who took part for their liberal assistance and support in getting up our programme and manual.

This is hardly consistent. If church fair and programme advertising is "fake advertising" for the retailer; convention programme advertising is equally as much a waste of money to the jobbers and manufacturers.

When the associations were weak and few in number, the jobbers and manufacturers were willing, in fact, glad, to assist them in getting out their programmes, realizing that the advertising was of very little value to them. But now they are strong enough and do not need this financial assistance, and, furthermore, instead of five associations, there are now some twenty-five, and if jobbers and manufacturers help one, they are supposed to help all in their territory.

Like the retailer when called on by a friend to "donate" for a church social that he knows will do him no financial good, the jobbers and manufacturers "put up," look pleasant, say they are *dee*-lighted to assist the retailer, and nine out of every ten return to their inner office and plan on ways and means to "duck" this pleasure (?) in future.

Is it honorable for the retailers to ask of those from whom they buy to do by them what they condemn in their customers?

Can the retailers expect to gain the favor of jobbers and manufacturers by continuing to solicit help from their best friends which is freely (?) given because of the same feeling the unwilling retailer subscribes to the local baseball programme?

Mr. Retailer, these unwilling contributions to your programmes from your friends will in time change those who are your most royal and ardent supporters to-day into an indifferent class—not enemies, but not workers with you, and their work and hearty support is needed far more than programme contributions.

The National Board of Trade, a powerful organization, for 12 years endorsed Parcels Post and at their

last annual Convention held in Washington, January 15 and 16 last,

> *Resolved*, That the National Board of Trade is opposed to any legislation looking to the establishment of a parcels carrying system in connection with the Post Office Department of the country at this time.

And this change of heart was brought about entirely by the United efforts of the National Jobbers and American Hardware Manufacturers' Associations, through their representatives.

We beg of the retailers to take this subject home with them and think it over, then act with justice to all and the result will be beneficial to them as well as satisfactory to their friends. ED. FORD.

PUSHING FANCY METAL WARE.

THE disposition of retail Hardware merchants to devote increased attention to so-called Fancy Metal Ware is distinctly recognized. They have not only broadened the scope of their business to include numerous lines not previously handled, but have enlarged their assortments of articles formerly neglected. Reports from all sections agree that as a result of their enterprise in this direction Hardware merchants have just secured a much larger share of Christmas business than ever before and will be encouraged to continue their aggressive policy.

Manufacturers of such lines are not slow to feel the tendency in their favor and many of them are wisely directing their efforts in a way to take advantage of the tide. The advertising campaign now being conducted by Landers, Frary & Clark, New Britain, Conn., is an example of such well directed effort and shows the disposition of leading manufacturers to co-operate with the trade in a substantial way. The company states that it has found a large class of Hardware merchants who are eager to take on high grade lines which not only are profitable, but add to the attractiveness of the store. An increasing number are using the electrotypes for local newspaper advertising which are furnished gratis, while the company's own advertisements in periodicals, &c., of general circulation are effective in familiarizing the consuming public with the company's Table Cutlery, Coffee Percolators and other household specialties. There is reason to believe that the growth of such close relations between manufacturer and final distributer is attended by results gratifying to both.

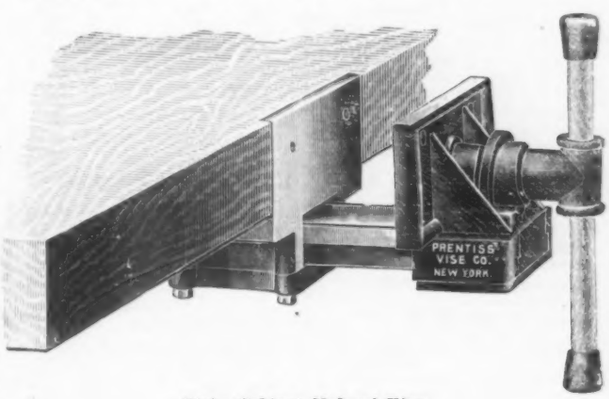
MISCELLANEOUS NOTES.

E. F. Reece Company.

The E. F. Reece Company, Greenfield, Mass., has increased the number of assortments of its high grade Reece screw plates, and is now prepared to supply them with tap wrenches included whenever required. The list of assortments include screw plates cutting sizes as small as 1-16 in., and large as 2 in. The company furnishes its patent adjustable guide stocks in these screw plates, and the adjustable guide takes the place of the more common solid guide.

Blake Cabinet Makers' Vise.

The cabinet makers' vise, illustrated herewith, is devised to be fastened underneath the work bench, leaving the jaws flush with the top, to adapt it to hold every description of woodwork. The vise has an instant adjustment and quick release, so that no time is lost in putting in or taking out work. Two sizes of the vise are made, one with 8-in. jaws, opening 8 in., and weighing 33 lb.; the other size has 10-in. jaws, opens 12 in., and weighs 55 lb. These are offered by the Prentiss Vise Company, 44 Barclay street, New York.



Blake Cabinet Makers' Vise.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, City, raw	@43
City, Boiled	@44
State and Western, raw	@41
Raw Calcutta, in bbls.	@70
Lard, Extra Prime, Winter	@80
Extra No. 1	@54
No. 1	@47
Cotton-seed, Crude, f.o.b. mills	34½@40
Summer Yellow, Prime	43½@44½
Summer White	@52
Yellow Winter	@52
Sperm, Crude	@53
Natural Winter	@66
Bleached Winter	@69
Bleached Winter, Extra	@72
Tallow, Prime	@61
Whale, Crude	@36
Natural Winter	@46
Bleached Winter	@48
Extra Bleached Winter	@50
Menhaden, Brown, Strained	@33
Light Strained	@33
Northern	@..
Southern	@..
Cocoanut, Ceylon ₱ lb	9¾@..
Cochin ₱ lb	@10
Cod, Domestic, Prime	@35
Newfoundland	34½@42
Red, Ela'ne	@48
Saponified ₱ lb	6½@ 7
Olive, Italian, bbls, Yellow	@75
Neatsfoot, Prime	@55
Palm, Logos ₱ lb	@ 7¾

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	@12
29 gravity, 15 cold test	@13
Summer	@12
Cylinder, light filtered	18¼@19½
Dark, filtered	16½@17½
Paraffine, 903-907 gravity	@14½
903 gravity	13 @13½
883 gravity	10¾@11¼
Red	13 @14½

Miscellaneous—

Barytes:	
White, Foreign ₱ ton	$18.50@20.50
Amer. floated ₱ ton	19.00@20.00
Off color ₱ ton	13.00@16.50
Chalk, in bulk ₱ ton	3.00@ 3.25
In bbls. ₱ 100 lb	.@ .35
China Clay, Imported ₱ ton	11.00@17.50
Cobalt, Oxide ₱ 100 lb	2.50@ 2.60
Whiting, Commercial ₱ 100 lb	.43@ .52
Gilders ₱ 100 lb	.55@ .65
Ex. Gilders ₱ 100 lb	.60@.....

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls.	74 @74½
In machine bbls.	74½@75

Glue—

	₱ lb
Cabinet	12 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	12 @14
Foot Stock, Brown	9 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	47 @48
Bones, Dried	57 @58
Button	40 @50
Diamond I.	55 @..
Fine Orange	52 @55
A. C. Garnet	44 @45
Kala Button	37 @38
D. C.	59 @60
Octagon B.	@54
T. N.	47 @48
V. S. O.	@56

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 7½
Lots less than 500 lb, in Oil	@ 8
Lead, English white, in Oil	9¾@10
Lead, White, in oil, 25 lb tin pails, add to keg price	.. @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	.. @ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	.. @ 1½
Lead, American. Terms: For lots 12 tons and over ¼c rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
Zinc, American, dry	5⅞@ 6½
Zinc, French:	
Antwerp, Red Seal, dry	9¾
Antwerp, Green Seal, dry	10¾
Paris, Red Seal, dry	9¾
Paris, Green Seal, dry	11
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	13¼@13¾
Lots of less than 1 ton	13¾@13⅞
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11⅞@12¾
Lots of less than 1 ton	12⅛@12⅝

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	6¼@10
Black Drop, American	4 @ 6
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com.	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	30 @33
Blue, Prussian	28 @32
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 7
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 7¾
Litharge, bbls., ½ bbls., kegs	@ 7¾
Ocher, American ₱ ton	$8.50@16.00
American Golden	2¼@ 3½
French	1¼@ 2
Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
French	10¾@12
German	8½@10
American	8½@ 8¾
Red, Indian, English	4½@ 6
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer. ₱ 100 lb	$0.50@1.25
English ₱ 100 lb	$1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Italian, Raw, Powdered	3 @ 7
American, Raw	1¼@ 2
American Burnt and Pow'd	1¼@ 2
Talc, French ₱ ton	$17.00@25.00
American ₱ ton	17.00@25.00
Terra Alba, French ₱ 100 lb	.90@ 1.00
English ₱ 100 lb	.80@ 1.00
American ₱ 100 lb, No. 1	.75@ .80
American ₱ 100 lb, No. 2	.60@ .65
Umber, Turkey, Burt, & Pow.	2¼@ 3½
Turkey, Raw and Powdered	2¼@ 3½
Burnt, American	1¼@ 2
Raw, American	1¼@ 2
Yellow Chrome	13 @15
Vermilion, American Lead	10 @25
Quicksilver, bulk	65 @..
Quicksilver, bags	@65
English, Imported	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....℔ lb @8¼¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....℔ lb 9⅝@9¾¢

Imported—

Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....70%
Jennings' Pattn., reg. finish.... 60&5@60&10%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $36; No. 2, $18.....60&10&10%
Ford's, Clark's Pattern.....60%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $36.00.....60&10&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....*gro.* $2.75@3.00
Unhdled, Shldered...*gro.*63@66¢
Unhandled, Patent..*gro.*66@70¢
Peg Awls:
Unhandled, Patent..*gro.* 31@34¢
Unhdled, Shldered..*gro.* 65@70¢
Scratch Awls:
Handled, Com...*gro.* $3.50@4.00
Handled, Socket..*gro.*$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose..3½@4 ¢
*No. 1½ Com., New Style*3¾@4¼¢
No. 2 Solid Collar.....3¾@4¼¢
Half Patent:
Nos. 7, 8, 11 and 12....70@75%
Nos. 13 to 14.....70@75%
Nos. 15 to 18.....75@75&5%
Nos. 19 to 22.....75@75&5%

Boxes, Axle—

Common and Concord, not turned lb., 4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....*lb.*, 9½@10¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3@3½¢

Towel—

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.95
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....℔ doz. $1.50
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dover.....$6.00
Western, W. G. Co., ℔ gro., Buffalo, No. 2, $8.00; Perfection, No. 3, $9.00.
Wonder (R M, Co)..℔ gro. net, $6.25

Bellows—

Blacksmith, Standard List..
Split Leather.....45%
Grain Leather.....60%

Hand—

Inch..	6	7	8	9	10
Doz...	$5.50	6.15	6.60	7.15	7.70

Net Prices.

Molders—

Inch..	9	10	11	12	14
Doz...	$8.00	9.00	10.50	12.50	14.50

Net Prices.

Bells— Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Barton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Polished, Brass.....60@60&5%
White Metal.....50&10@50&10&5%
Nickel Plated.....50@50&10%
Swiss .....50&10@50&10&5%
Coue's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....*lb.*, 2¼@2½¢
Church and School.....60%
Table Call Bells.....50@50&10%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....45%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops— See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron.....50%
Stowell's Loading.....50&10%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash— See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ × 6 and smaller.70&12½@—%
Larger and Longer.60&12½@—%
Phila. Eagle,$3.00 list May 24,'99 80%
Bolt Ends.....65@65&5%
Machine, ⅜ x 4 and smaller.. 70&12½@—%
Machine, larger and longer.. 60&7½@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	3	4	5	6	8
Per doz.	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch.....	6	8	10
Per doz.....	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch.....	6	8	10
Per doz.....	$1.00	1.40	1.85

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	6	8	10
Per doz.....	$0.75	.95	1.25

Wrought Barrel Japd.80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door.. .....50%

Plow and Stove—

Plow .....65&10@—%
Stove .....85@85&10%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	1¼	1½	1¾	2
Per doz...	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz.....	$6.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 40%
Stanley R. & L. Co.: Nos. 240 to 460, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball Bearing, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel.....80@80&5%
Griffin's Pressed Steel.....75&10@80%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

M'f'gr's list, price per gross.

Quart..	10	12	14	
Water, Reg...	25.35	28.00	32.00	10&5%
Water, Hvy...	45.35	48.00	52.00	
Fire, Rd. Btm.	32.00	34.65	38.65	
Well	37.35	41.35	45.35	

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26, '06. 50%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Discount.

Reversible and Broad..75%
Light Reversible, Light Narrow 75%
*Loose Joint, Narrow, Lht Inside Blind, etc.*70&10%
Back Flaps, Table, Chest 70%

Extra, 10&10@

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, 10%; 1200, 25%; 200, 300, 600, 900 .....40%
Hendryx Bronze: Series 700, 800..40%
Hendryx Enameled.....40%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb., 4@4½¢
Sharp, 1 prong...per lb., 4½@4¾¢
Burke's Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Gautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M..$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$9.15	6.30	5.25	4.55	4.35	4.15	4.10

⅝ ¾ ⅞ to 1 1-16 1⅛ to 1¼ inch.
$4.00 3.90 3.85 3.95
German Coil.....60&10&10@70%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 2, '97.....60&10&5%
Covert Mfg. Co.
Halter.....35&5%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring..$27.00
6½—6-2, Straight, with ring..$28.00
6½—8-2, Straight, with ring..$32.00
6½—10-2, Straight, with ring..$37.00

NOTE.—Add 2c per pair for Hooks. Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c.....60&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....50&10%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain.....lb. ¼@4½%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
American Halter, Dog and Kennel Chains.....35&2½@40%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....80%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 45@50¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's.....45%
Pullman, per gro.....$54.00
Russwin.....33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters,' etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List.....75@75&5%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....60%
Socket Framing No. 15.....60%
Swan's.....75%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....40%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold—lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....40%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws.....40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....30%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 82 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..30%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal 11, 12, 16, 17, 13, 14, 15..35%
Universal, No. 42.....30%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and 72.....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....40&10@50%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7⅛ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$6.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 25

Clips, Axle—

Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....60&10@65%
Compression Bibbs...55&10@60%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers.....55%
Lodi Dividers.....75%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized Galv. Steel.	Charcoal Iron.	Copper. 14, 16&20 oz.
Eastern:			
	70%	50&17½%	30%
Central:			
	65&10%	55&21½%	20&10%
Western and Southern:			
	65&5%	50&7½%	20&7½%
So. Western			
	50&25&2½%	50%	20&5%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled, 25%; Agate Lined, 25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 32@35¢; lighter than 3 lb. to pair.....34@37¢

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 26½¢; No. 6, 27½¢.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia.....lb...20¢
Cable Laid Russia.....lb...21¢
India Hemp, Br'd'd.....lb...21¢
India Hemp, Twisted..lb.13@14¢
Patent India, Twisted...lb...17¢
Anniston Cordage Co.: ℔ lb. solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ℔ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ℔ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@ 50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White.....℔ lb 40¢
Massachusetts, Drab.....℔ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
} 12½
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen...57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906...85&10&10@—
Hendryx Standard Wire Picture Cord, old list. 85&10%
Turner & Stanton Co. Wire Picture Cord.....90%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@57.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ℔ gro, White and Purple, Indelible....$7.50 Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles.....$18.75
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ⅛ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $7.00; Light.....$6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$1.50	$6 25@25&7½%

No. 202, $1.50.....40&7½%
Dixon's.....℔ doz. 30@30&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40@40&5%
Little Giant.....℔ doz. 40@50%

Nos.	308	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ℔ doz. $24.00.....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....℔ doz. 30@30&5%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater.....℔ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..℔ gr. $18@$20
Slaw Cutters, 2 Knife..℔ gr. $22@$25

Tobacco—

All Iron, Cheap..doz. $1.25@$1.50
Enterprise.....25@30%
National, ℔ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00.....25%
Samson, ℔ doz., $34.00.....25%
Iwan's Imp'ved Post Hole Auger.40&5%
Vaughan Pattern Post Hole Augers, ℔ doz., $6.25
Perfection Post Hole Diggers, ℔ doz.....$3.75
Split Handle Post Hole Diggers, ℔ doz., $7.75
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer.....$7.00
Never-Break Post Hole Diggers, ℔ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ℔ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills.50&10@60&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2¼-in., $6; 4-in., $7.50; 6-in. ℔.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers.....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....30%
Smith & Hemenway Co., Neverturn, 40&5%; Elmora.....50%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Warn. Handles, 60&10%; No. 86, 70%; Defiance, 70%; Hurwood, 55%.
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

	Galv. Steel.	Charcoal Iron.	Copper. 14, 16&20 oz.
Territory.	*L. C. L.*	*Galvanized*	
Eastern:			
	70&30%	70%	30%
Central:			
	75&10&2½%	65&10%	20&10%
Western and Southern:			
	75&7½%	65%	20&7½%
So. Western:			
	75%	60&10%	20&5%

Terms, 2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I. Standard Gauge.....80%
No. 26.....
No. 24.....25%
No. 22.....
Copper.....40&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Dover, one piece (R. M. Co.)....40&10%
Perfect Elbows.....40%

Emery, Turkish—

	4 to 4½:	5 to 22:	Flour.
Kegs.....lb.	5 ¢	5½ ¢	5¼ ¢
½ Kegs.....lb.	5¼ ¢	5¾ ¢	5¾ ¢
¼ Kegs.....lb.	5½ ¢	6 ¢	6 ¢
10-lb. cans, 10 in case....	6½ ¢	7 ¢	8 ¢
10-lb. cans, less than 10.....10	¢	10 ¢	9 ¢
Less quantity..10	¢	10 ¢	9 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

Fasteners, Blind—See *Squeezers, Lemon.*

Zimmerman's ..... 50&10%
Walling's ..... 40&10%

Cord and Weight—

Ives 33⅓%

Faucets—

Cork Lined ..... 50@50&10%
Metallic Key, Leather Lined .. 60&10@70%
Red Cedar ..... 40&10@50%
Petroleum ..... 70&10@75%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mtl. Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
McKenna, Brass:
Burglar Proof, N. P. 25%
Improved, ⅞ and ⅞ inch 25%
Self Measuring:
Enterprise, ℔ doz. $36.00 ..... 40&10%
Lane's, ℔ doz. $36.00 ..... 40&10%
National Measuring, ℔ doz. $36 ..... 40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@75&10&10%
Lower Grade ..... 75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz	*$3.25*	*3.75*	*4.25*	*4.75*

P., S. & W. Co. ..... 30&10%
Reading Hardware Co. 60%
Stowell's Giant Grindstone Hanger .. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 40&10%; Light 50%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Header 65%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawley Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz ..... 75@80¢
Red, S'g't Bar, per doz ..... $1.00@1.25
Red, Dbl. Brace, per doz ..... $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped 3.65
Waterproof Dbl. Taped 4.40
Waterproof Tpl. Taped 5.15
10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80&10%

Gauges—

Marking, Mortise, &c. ..... 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c. 67½%
Stanley R. & L. Co.'s Butt and Rabbet Gauge 35%
Marking and Mortise 55%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse's 25%
Wire, P., S. & W. Co. 30%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1 ..... $2.00; 2, $2.20
Spike, Metal, No. 1 ..... $4.00; 2, $4.80
Nail, Wood Handled, No. 1 ..... $2.30; 2, $2.60
Spike, Wood Handled, No. 1 ..... $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush .. 25&10@50%
International Glue Co. (Martin's) .. 40%

Grease, Axle—

Common Grade ..... gro. $4.50@6.00
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb. $1.20; 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00 ..... 33⅓%
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20A, $6.00; 20A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 50%
Peck, Stow & Wilcox, Steel 50%
Fayette R. Plumb:
Plumb, A. E. Nail ..... 40&2½@40&12½%
Engineers' and B. S. Hand ..... 50&12½@60%
Machinists' Hammers ..... 50&15@60&5%
Riveting and Tinners' ..... 40&2½@40&12½%

Heavy Hammers and Sledges—

Under 3 lb., per lb. ..... 50¢.80&5@..%
3 to 5 lb., per lb. ..... 40¢.80&5@..%
Over 5 lb., per lb. ..... 80¢.... 80&10&5@..%
Wilkinson's Smiths' ..... lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c. ..... 60&10@60&10&5%
Hoe, Rake, &c. ..... 40@45&5%
Fork, Shovel, Spade, &c.:
Long Handles ..... 40@45&5%
D Handles 40%

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ..... gro. $2.50@$3.00
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory ..... $2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory ..... $1.45@$1.60
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80¢85¢; *Not Varnished* ..... 65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 20&10%
Nicholson Simplicity File Handle .... ℔ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&10%
Roller Bearing 70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 70%
Roller Bearing, No. 11, $15.00 ..... 70%
Roller Bearing, Ex. Hy., No. 22, $18.00 ..... 70%
Hinged Hangers, $16.00 ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&5%
Hinged ..... net $6.08
Covered ..... 60&2%
Special ..... 70&5%
Lawrence Bros.:
Advance and Sterling ..... 60&2½%
Cleveland and Peerless ..... 70&7½%
Clipper, No. 75 ..... 60&5%
Crown ..... 60&2½%
Cyclone-Tandem ..... net $7.50
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant 60%
Hummer ..... 70&7½%
New Cyclone, Flexible, $16.00 60%
New York ..... 60&2½%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers ..... 60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller B'r'g St'l Track No. 12 ..... $2.20
Roller B'r'g St'l Track No. 13 ..... $2.50
Roller B't'g, Nos. 30, 41, 43, ... 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 44, 2½ and 3 ..... 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 20 ..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 136 ..... 40%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing 30%
Ajax Hinge Door 60%
Apex Parlor Door ..... 50&10&5%
Atlas 60%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Express 50%
Lundy Parlor Door 50%
Matchless 60%
Nansen 70%
Parlor Door, 50&10%; Railroad, ... 50&10%
Steel, Nos. 300, 404, 500 ..... 50%
Underwriters' Fire Door 40%
Wild West Warehouse Door 50%
Wilbern, No. 0, net, ℔ doz. $9.00
Zenith for Wood Track 50%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle 70%
Climax Anti-Friction ..... 50&10%
Hylo Hinge, New Perfection, Pilot, Pilot Hinge 60%
Rider Wooster 65%
Western Pattern 70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing .. 50&15&10&5%

Extra 5&10% often given.

Hangers— Garment—

Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... ℔ gro. $9.60
Western, W. G. Co. ..... 75&10%

Gate—

Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ℔ doz. .. 50%

Hatchets—

Regular list, first qual. ..... 40¢7½¢—
Second quality ..... 50&10@—

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ℔ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&10&5%
Acme, Lull & Porter ..... 75&10%
Queen City Reversible ..... 75&10%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5 ..... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&10&5%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75 ..... 75%
Steamboat Gravity Locking, No. 10 ..... 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.85*

New England:
With Latch ..... *doz.* ..... @$2.00
Without Latch ..... *doz.* ..... @$1.60
Reversible Self-Closing:
With Latch ..... *doz.* ..... @$1.75
Without Latch ..... *doz.* ..... @$1.35
Western:
With Latch ..... *doz.* $1.75
Without Latch ..... *doz.* $1.15

Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets, Nos. 1, 2, 3

Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron ..... $6.50@$7.00
Non-Holdback, Cast Iron $6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ℔ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4 ..... ℔ gr. $9.00
New Idea No. 1 ..... ℔ gr. $9.00
New Idea, Double Acting 50%
New Idea Floor 50%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges 65%
Heavy Strap Hinges 70%
Light T Hinges 60%
Heavy T Hinges 50%
Extra H'y T Hinges 66⅔%
Hinge Hasps 45%
Cor. Heavy Strap 70%
Cor. Ex. Heavy T 66⅔%
Extra, 10&5% @ 10&10%

Screw Hook and Strap.
6 to 12 in. ..... lb. 3½¢
13 to 20 in. ..... lb. 3½¢
22 to 36 in. ..... lb. 3¼¢

Screw Hook and Eye:
¾ to 1 inch ..... lb. 6¼¢
⅝-inch ..... lb. 7¼¢
½-inch ..... lb. 8¼¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	15	16	17	18
Galv. Open	$35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	43	48	52	56
Jap. Funnel	33	36	39	43

10&5%

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....30%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding, No. 1, $2.75; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....10&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 66⅔%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe..₱ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....₱ doz., net, $4.25
W. & C. L'tning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ₱ doz. $24.00.....45&10%

Door—
Bardsley's, Iron, 40%; Brass and Bronze.....33⅓%
Empire.....50%
Pullman.....35%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Trace and Rein—
Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz. pairs..$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....60%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....80%
Wire C. & H. Hooks:.....
75@75&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60&5@60&10&5%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....80&10&10%
Bench hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Guaranteed..ft. 8 @ 9 ¢
4-ply Guaranteed..ft. 10 @11 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons— Sad—
From 4 to 10.....lb. 3 @3¼¢
B. B. Sad Irons.....lb. 3¼@3½¢
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	80	77	90	88
Tin'd Tops	85	82	95	92

New England Pressing, lb. 3¾@4¢

Pinking—
Pinking Irons.....doz. 90¢

Irons, Soldering
See *Copiers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Shear & Cutlery Co., Wilcut Brand Knives and Hooks.60%
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....75&5@75&10%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42....75%
Swan's.....70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.75@6.00
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Mincing—
Buffalo.....₱ gro. $13.00

Miscellaneous—
Farriers'.....doz. $3.00@3.25
Westenholm's.....₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. $1.25@$1.40
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz. $4.25@4.50
Lift Tubular, No. 0.....
doz. $4.75@5.00
Hinge Tubular, No. 0.....
doz. $4.75@5.00
Other Styles.....40@40&5%

Bull's Eye Police—
No. 1, 2¾-inch.....$2.75@3.00
No. 2, 3-inch.....$3.00@3.25

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw..
doz. 35@40¢

Door—
Allith Mfg. Co., Automatic, No. 400, ₱ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.90
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Lifters, Transom—
R. & E.....10%

Lines—

Wire Clothes, Nos.	18	19	20
100 feet	$2.25	2.00	1.75
75 feet	$1.75	1.55	1.10

Anniston Waterproof Clothes, 50 ft., ₱ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks.....33⅓%

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Elevator—
Stowell's.....50%

Padlocks—
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 60%; Crescent, 40&20%; Iron, 60%; Window Ventilating, 55%; Robinson Pat. Ventilating Sash Lock, 33⅓%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..35%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers,
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....33⅓%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—
Reisinger Invincible Hand Power.....₱ doz. $18.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—
Chandler's.....12½%

Washing—
Boss Washing Machine Co.: Per doz.

Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—
Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list.50%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Motors Water—
Divine's Red Devil.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....all sizes, $1.85@2.00
Cheap.....all sizes, $2.00@2.50
Better Grade..all sizes, $2.50@4.50

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr. Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....35⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70&10&10%
Style B, Low Wheel.....70&10%
Style C, High Wheel, spcl. disct.. 70&10%
Style D, High Wheel, spcl. disct.70%
Philadelphia:
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse.....40&5%
Pony.....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—
Wire Nails and Brads, Miscellaneous.....85&10@85&10&5%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	..40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	..40&5%
Livingston	19	18	17	16	16	.....10%
Western						₱ lb 8¼¢

Jobbers' Special Brands.....
per lb. 9@10¢

Picture—

	1½	2	2½	3	in.
Brass H'd	.55	.60	.70	..	gro
Por. Head	1.10	1.10	1.10	..	gro

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: *Off list.*
Square, Blank or Tapped..4.80¢
Hexagon, Blank or Tapped..5.10¢
Square, B'k, C., T. & R...5.10¢
Hexagon, B'k, C., T. & R..5.70¢
Hot Pressed:
Square, Blank.....5.00¢
Hexagon, Blank.....5.40¢
Square, Tapped.....4.70¢
Hexagon, Tapped.....5.10¢

Oakum—
Best.....lb., 6½¢
U. S. Navy.....lb., 6¢
Navy.....lb., 5¢
Plumbers' Spun Oakum.....8¾¢
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....50&10%
Tin or Steel.....65&10&5@70%
Zinc.....65&10&5@70%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
Vim Tin Shear and Can Opener. ₱ doz., 75c.; per gro., $7.50
Yankee Can and Bottle Opener, ₱ doz., net.....$0.75

Egg—
Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope.....20@25¢

Rubber—
(*Fair quality goods.*)
Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ₱ lb. 80¢.....25%

Miscellaneous—
American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—
R. M. Co., with gauges, ₱ doz., No. 1, $6.25; No. 2, $6.50.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....65&7½%
Edwards, Royal Blue.....65&7½%

Fry—
Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.80	3.15

Roasting and Baking—
Regal, R. M. Co., ₱ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper
Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.3½to5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....6¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.....3@5¢
Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll 40@50¢
Medium weight, 30 lbs. to roll. 50@55¢
Heavy weight, 40 lbs. to roll.. 65@70¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$50.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—
1 ply (roll 400 sq. ft.), ton.....
$31.00@$35.00
2 ply, roll 108 sq. ft.....57¢
3 ply, roll 108 sq. ft.....80¢
Slater's Felt (roll 500 sq. ft.).76¢

Sand and Emery—
Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Advance	₱ doz.	$4.00
Baldwin	₱ doz.	$4.00
Bonanza Improved	each	$6.50
Daisy	₱ doz.	$4.00
Dandy	each	$7.50
Eureka Improved	each	$20.00
Family Bay State	₱ doz.	$15.00
Improved Bay State	₱ doz.	$36.00
Little Star	₱ doz.	$5.00
New Lightning	₱ doz.	$7.00
Reading 72	₱ doz.	$3.25
Reading 78	₱ doz.	$6.25
Rocking Table	₱ doz.	$8.20
Turn Table '98	₱ doz.	$8.00
White Mountain	₱ doz.	$5.00

Potato—
Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—
List, Feb. 23, 1899 ..... 70&10@75%
Cronk's Handled Garden Mattock, ℔ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50&10@60%
Iron, list Nov. 11, '85 .. 60@60&10%

Pipe, Cast Iron Soil—
Carload lots.
Standard, 2-6 in. .. 50&10@50&10&5%
Extra Heavy, 2-6 in. ..... 65&10%
Fittings ..... 70&10@70&10&5%

Pipe, Merchant—
Consumers, Carloads.

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
	%	%	%	%
⅛ & ¼ in.	66	50	59&5	45&5
⅜ in.	68	54	61&5	48&5
½ in.	70	58	63&5	51&5
¾ to 6 in.	71	64	68&5	58&5
7 to 12 in.	69	54	63&5	48&5

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class ..... 85@86%
Second-class 90%
NOTE.—Market irregular.

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50

Planes and Plane Irons—
Wood Planes—
Bench, first qual. .. 30@30&10%
Bench, second qual. .. 40@40&10%
Molding ..... 25@25&10%
Bailey's (Stanley R. & L. Co.) .. 35&2½%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes—
Bailey's (Stanley R. & L. Co.) .. 35%
Chapin's Iron Planes ..... 60&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 30&5%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Stanley R. & L. Co. 35%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ℔ doz. $3.00

Plates—
Felloe ..... lb. 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ℔ doz. $2.00 ..... 50%

Pliers and Nippers—
Button Pliers .. 75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe..

7	8	10	12-in.
$2.00	$2.25	$2.75	$3.50

Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
The Nettleton Mfg. Co. Reversible Cutting Nippers 40%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Paragon, 50%; Lodi, 50%.
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor. .. 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Machinists' Levels ..... 40@40&10%
Disston's Plumbs and Levels .. 60&10%
Disston's Pocket Levels ..... 60&10%
C. E. Jennings & Co.'s Iron 33⅓%
C. E. Jennings & Co.'s Iron, Adjustable ..... 40&7½%
Stanley R. & L. Co. 40%
Stanley's Duplex 38%
Woods' Extension 33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00 ..... 50%

Points, Glaziers'—
Bulk and 1-lb. papers ..... lb. 10¢
½-lb. papers ..... lb. 9@10½¢
¼-lb. papers ..... lb. 9¾@11¢

Pokes, Animal—
Ft. Madison Hawkeye ..... ℔ doz. $3.25
Ft. Madison Western ..... ℔ doz. $4.00

Police Goods—
Manufacturers' Lists .. 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.00 .. 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50, ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can .. each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $4.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ℔ doz. $1.50
Wynn's Black Silk:
Paste, cans, ℔ doz., 5 oz., $0.75; ½ lb, $1.00; 1 lb $1.75
Paste, ℔ 5 lb can $0.70
Liquid, cans, ℔ doz., 6 oz., $0.75; ½ pt., $1.00; 1 pt. $1.75
Steel Range Enamel, ℔ doz., ¼ pt., $1.00; ½ pt., $1.25.

Poppers, Corn—
1 qt. Square..doz. $0.80; gro. $8.00
1 qt. Round..doz. $0.90; gro. $9.00
1½ qt. Square.doz. $1.00; gro. $10.00
2 qt. Square..doz. $1.20; gro. $12.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb ..... *each 45¢*
Fine Sporting, 1 lb .. *each 75¢*
Rifle, ½-lb ..... *each 15¢*
Rifle, 1-lb ..... *each 25¢*
In Kegs:
12½-lb. kegs *$3.50*
25-lb. kegs *$4.50*
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c., bk)	7.25	8.75

Robin Hood Sm'less Shot Gun .. 50&20%

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ..... 30@25%
Seal Presses—
Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00 .. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
Scranton, Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B, case lots, ℔ doz., Large, $9.00; Small, $7.50.
Giant No. 1, ℔ doz., $18; No. 1½, $16.50; No. 3, $15 ..... 33⅓%
Staple Pullers, Utica and Davison 60%
Parrot Tack and Stub Puller, ℔ doz. 75c.; ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch		2	2¼	2½
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Stowell's:
Ceiling or End, Anti-Friction .. 60&10%
Dumb Waiter, Anti-Friction .. 60&10%
Electric Light 60%
Side, Anti-Friction ..... 60&13%

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in. ..... *16@19¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in. .. *17@19¢*
Acme ..... 1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in. ... ℔ doz. 50%
Grand Rapids All Steel Noiseless .. 50%
Ideal ..... 70&5%
Niagara ..... 1¾ in., 16¢; 2 in., 19¢
No. 26, Troy .. 1¾ in., 14½¢; 2 in., 16½¢
Star ..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout .. 75&5@75&10%
Wood Pumps, Tubing, &c. .. 45@50%
Barnes Dbl. Acting (low list) .. 40&10%
Barnes Pitcher Spout ..... 75&10%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list) 55%
Flint & Walling's Fast Mail (low list) 55%
Flint & Walling's Tight Top Pitcher. 75&10&5%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $8.50 ..... 30%
Myers' Pumps (low list) ..... 40&10%
Myers' Power Pumps ..... 40&10%
Myers' Spray Pumps ..... 40&10%

Pump Leathers—
Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾	4
	$3.30	3.60	3.85	4.10	4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—
Saddlers' or Drive, good ..... *doz. 50@75¢*
Spring, single tube, good quality ..... *$1.75@3.00*
Revolving (4 tubes) ..... *doz. $3.50@3.75*
Bemis & Call Co.'s Cast St'l Drive .. 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 33⅓%; Paragon, 50%; Lodi 50%
Tinners' Hollow, P., S. & W. Co. 33⅓%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 50%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail .. ℔ ft. 3¼¢
O. N. T. Rail ..... 3¢
Hinge Rail ..... 396¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.80.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $3.96.
O. N. T., ℔ 100 ft., 1 in., $3.00; 1¼ in., $3.60; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft., No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $3.00
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢ .. 50%
None Better ..... ℔ ft. 3¾¢
Standard ..... ℔ ft. 4 ¢
Myers' Stayon Track ..... 60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail .. 60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 22¢ .. 60&10%
No. 50 .....
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Stowell's:
Cast Rail ..... ℔ ft. 2¼¢
Steel Rail, Plain 25%
Wrought Bracket, 1 3-16 in. .. ℔ ft. 3¢
Wrought Bracket, 1¼ x 5-16 .. ℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢ 60%
P. L. B. Steel Rail ..... ℔ 100 ft. $3.00
No. 0, 1 x 3-16 ..... ℔ 100 ft. $3.00

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn .. $3.25
Fort Madison Blue Head Lawn .. $2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net $4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00 .. 75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00 ..... 80%
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Lawn Queen, 20-tooth .. ℔ doz. $2.90
Lawn Queen, 24-tooth .. ℔ doz. $3.00
Paragon, 20-tooth ..... ℔ doz. $2.70
Paragon, 24-tooth ..... ℔ doz. $2.75
Steel Garden, 14-tooth .. ℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros. ..... 70&5@70&10&5%
Liveright Bros.' Gold Medal .. 70&10@75%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic 60%
Fox Razors, ℔ doz., No. 42, $36.00; No. 44, $30.00; No. 82, Platina, $25.00 ..... 40, 25, 20%
Red Devil 50%
Silberstein:
Carbo Magnetic, $21.00; Griffon, No. 65, $13.50; Griffon, No. 00, $12.00; all other Razors, 40%.

Safety Razors—
Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein 40%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze .. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 28 PN 20%
2904 P, 33⅓%; 2904 PN, 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓% 25%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN .. 33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed ..... 66⅔@66⅔&10%
White Porcelain Enamel 60%
Solid Brass or Bronze Metal, 40&10%

Revolvers—
Single Action ..... 95¢@$1.00
Double Action, except 44 cal. .. $1.85
Double Action, 44 caliber $2.00
Automatic $3.25
Hammerless $3.75

Riddles, Hardware Grade
16 in. ..... *per doz. $2.50@$2.75*
17 in. ..... *per doz. $2.75@$3.00*
18 in. ..... *per doz. $3.00@$3.25*

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, ℔ doz., Copper, 2 in., $1.25; 2½ in., $1.50; 3 in., $1.75.
Hog Rings and Ringers—
Hill's Rings, gro. boxes $4.00@$4.50
Hill's Ringers, Gray Iron ..... *doz. 50@55¢*
Hill's Ringers, Malleable Iron .. *doz. 70@75¢*
Blair's Rings...per gro. $4.75@5.25
Blair's Ringers..per doz. $0.60@ .65
Brown's Rings..per gro. $5.00@5.50
Brown's Ringers..per doz. $0.60@ .65

Rivets and Burrs—
Copper ..... 35@33⅓%
Carriage, Coopers', Tinners, &c.:
Black ..... 70&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 72¢; 100 count, 51@58¢.

Rollers—
Acme, Stowell's Anti-Friction 50%
Cronk's Stay No. 65, $0.90; No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56 ..... $0.84
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%
Stowell's Barn Door Stay .. ℔ doz. $1.00
Swett's Anti-Friction 50%
Screw and Spike Stay ..... ℔ doz. 65¢
Hinge Adjustable Stay ..... ℔ doz. 90¢

Rope—
Manila, 7-16 in. diam. and larger:
Pure ..... lb., 12½@13¢
Sisal, 7-16 in. diam. and larger:
Pure ..... lb., 9¼¢
Sisal, 7-16 in. diam. and larger: No. 2 quality ..... lb., 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed ..... lb., 7¾@8¢
Pure ..... lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed ..... lb., 7@7½¢
Pure ..... lb., 8¢
Cotton Rope:
Best, ¼-in. and larger .. 17@18¢
Medium, ¼-in. and larger. 16@17¢
Common, ¼-in. and larger .. 10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb. 9¢
Thread, No. 2, ¼-in. & up, lb. 8½¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—
Galvanized ..... 37½&2½%
Plain ..... 45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 55@55&10%
Stephens' Combination 55%
Stationers' 10%

Keuffel & Esser Co.:
Folding, Wood....35&10%
Folding, Steel....33⅓&10%
Lufkin's Steel....50&10%
Lufkin's Lumber....60%
Stanley R. & L. Co.:
Boxwood....60%
Ivory....45%
Miscellaneous....60%
Zig Zag....40%
Zig Zag, Pin Joint....42½%
Upson Nut Co.:
Boxwood....60@60&10%
Ivory....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular....45%
Band....50@50&10%
Butcher Saws....50%
Cross Cuts....35%
One-Man Cross Cut....40%
Narrow Cross Cut....50%
Hand, Rip and Panel....35&5%
Miter Box and Compass....40%
Mulay, Mill and Drag....45%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth..50%
Band, 2 to 18 in. wide....60%
Band, ⅛ to 1⅛....60%
Crosscuts....45%
Narrow Crosscuts....50%
Mulay, Mill and Drag....50%
Framed Woodsaws....25%
Woodsaw Blades....25%
Woodsaw Rods, Tinned....15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 5....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination....30%
Compass, Key Hole, &c....25%
Butcher Saws and Blades....30%
C. E. Jennings & Co.'s:
Back Saws....25%
Butcher Saws....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws....30%
Hand Saws....30&2½%
Wood Saw Blades....35%
Millers Falls:
Butcher Saws....15&10%
Star Saw Blades....15&10%
Massachusetts Saw Works:
Victor Kitchen Saws....40&10&50%
Butcher Saws Blades....35@40%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws....45%
Crescent Ground Cross Cut Saws..30%
One-Man Cross Cuts....40&10%
Gang Mill, Mulay and Drag Saws..45%
Band Saws....50%
Back Saws....25@25&7½%
Butcher Saws....35@35&7½%
Hand Saws....25@25&7½%
Hand Saws, Bay State Brand....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws....40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws....50%

Hack Saw Blades and Frames—
Atkins' Hack Saw Blades A A A..35%
Disston's:
Concave Blades....35%
Keystone Blades....35%
Hack Saw Frames....30%
Simonds File Co....35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades....40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Star Hack Saws and Blades....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades....25%
Victor Hack Saw Frames....40%

Scroll—
Barnes, No. 7, $15....25%
Barnes' Scroll Saw Blades....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20....20%
Lester, complete, $10.00....15&10%
Rogers, complete, $3.50 and $4.00..15&10%

Scales—
Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs....doz. $5.50
Two Platforms, ½ oz. to 8 lbs....doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka....25%
Favorite....40%
Crocers' Trip Scales....60%
Chicago Scale Co.:
The Little Detective....25 lbs 50%
Union or Family No. 2....60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list)..25@25%
The Standard Portables....45%
The Standard R. R. and Wagon....50&10%

Scrapers—
Box, 1 Handle....doz. $2.00@2.25
Box, 2 Handle....doz. $2.50@2.60
Ship....Light, $2.00; Heavy, $1.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00....40%
Chapin-Stephens Co., Box...30@30&10%

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood....20@20&10%
Hand, Wood....20@20&10%
R. Bliss Mfg. Co., Hand..20&5@20&10%
Chapin-Stephens Co., Hand....20%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99....75&15%
Coach, Gimlet Point, list Oct. 1, '99....75&10%
Hand Rail, list Jan. 1, '81....70&10@75%

Jack Screws—
Standard List....75%
Millers Falls....50&10&10%
P., S. & W....50%
Swett Iron Works....75@80%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron....50@50&10%
Flat or Round Head, Brass....50@50&10%

Set and Cap—
Set (Iron)....75&10&7½%
Set (Steel), net advance over Iron....25%
Sq. Hd. Cap....70&10&7½%
Hex. Hd. Cap....70&10&7½%
Rd. Hd. Cap....50&7½%
Fillister Hd. Cap....60&7½%

Wood—
List July 23, 1903.
Flat Head, Iron....87½&5@..%
Round Head, Iron....85&5@..%
Flat Head, Brass....82½&5@..%
Round Head, Brass....80&5@..%
Flat Head, Bronze...77½&5@..%
Round Head, Bronze..75&5@..%
Drive Screws....87½&5@..%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
Per doz.
Grass, No. 1, Plain....$6.25@6.75
Clipper, Bronzed Webb..$6.50@7.00
No. 3 Clipper, Pol'd Webb..$6.75@7.25
No. 6 Clipper and Solid Steel..$7.00@7.50
Bush, Weed and Bramble, No. 2..$6.50@7.00
Grain, No. 1....$8.25@8.75
Bronzed Webb, No. 1..$8.50@9.00
Nos. 3 and 4 Clipper, Grain..$8.75@9.25
Solid Steel, No. 6....$9.25@9.75

Seeders, Raisin—
Enterprise....25@30%

Sets—Awl and Tool—
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7....50%
C. E. Jennings & Co.'s Model Tool Holders....30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel....℔ doz sets $9.00

Sets, Nail—
Octagon....gro. $3.50@3.75
Buck Bros....27½%
Cannon's Diamond Point, ℔ gro.$12.40%
Mayhew's....℔ gro. $9.00
Snell's Corgated, Cup Pt....℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro. $7.20
Victor Knurled Cup Pt....℔ gro. $7.50

Rivet—
Regular list....75@75&10%

Saw—
Atkin's:
Criterion....40%
Adjustable....40%
Disston's Star, Monarch and Triumph....30%
Morrill's No. 1....$15.00
Nos. 3 and 4, Cross Cut....$20.60
No. 5, Mill....$30.00
Nos. 10, 11, 95....$15.60
No. 1 Old Style....$10.00
Special....$16.25
Giant Royal Cross Cut....℔ doz. $8.00
Royal, Hand....℔ doz. $4.50
Taintor Positive....℔ doz. $6.75
(50%)

Shaving—
Fox Shaving Sets, No. 30....℔ doz., net, $24.00
Smith & Hemenway Co.'s....60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz....$1.50
Mounted Kitchen Sand Stone, ℔ doz....$1.50
Natural Grit Carving Knife Hones, ℔ doz....$3.00
Quick Cut Emery Carving Knife Hones, ℔ doz....$1.50
Quick Edge Pocket Knife Hones, ℔ doz....$2.00
(33⅓%)

Skate—
Smith & Hemenway Co., Eureka..20%

Shaves, Spoke—
Iron....doz.$1.10@1.25
Wood....doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.), Iron, 50%; Wood....55%
Chapin-Stephens Co....30@30&10%
Goodell's ℔ doz. $9.00....15&10%
Wood's F1 and F2....50%

Shears—
Cast Iron..	7	8	9 in.
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....50@50&5%
Fair quality, Nickel..75@75&10%
Tailors' Shears....40@40&10%
Acme Cast Shears....40@40&5%
Heinisch's Tailor's Shears....10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list....30&10&5%
Grass....50&10%
Horse or Mule....50&10%

Tinners' Snips—
Steel Blades....20&5@20&10%
Steel Laid Blades....40&10@50%
Forged Handles, Steel Blades, Berlin....50%
Heinisch's Snips....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in....50%
Niagara Snips....40%
P., S. & W. Forged Handles....20%

Pruning Shears—
Cronk's Hand Shears....33⅓%
Cronk's Wood Handle Shears....33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00....25%
Disston's Pruning Hook only, ℔ doz. $12.00....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....40%
P., S. & W. Co....30%
Wilkinson Shear & Cutlery Co.:
Hedge, Wilcut Brand....60&10%
Lawn and Border, Wilcut Brand....60&10%

Sheaves—Sliding Door—
Stowell's Anti-Friction....50%
Reading....40%
R. & E. list....15%
Wrightsville Hatfield Pattern....80%

Sliding Shutter—
Reading list....40%
R. & E. list....10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, 10 and 12 gauge....65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade....25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge....20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%
Expert, 10, 12, 16 and 20 gauge, 33⅓&5%
Robin Hood, Low Brass....20&5%
Robin Hood, High Brass....30&5%
Indian, for Black Powder....25&5%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade....40&5%
Loaded with Smokeless Powder, high grade....40&10&10%
Robin Hood:
Smokeless Robin Hood, Low Brass....50%
Smokeless Comets, High Brass, 50&10&5%
Indian, Black Powder....40&5%
Winchester:
Smokeless Repeater Grade....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder....40%

Shingles, Metal— Per Sq.
Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

	Tin Painted.	Galv.
Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron....per keg.$4.10
Steel....per keg.$3.85
Burden's, all sizes....℔ keg $3.90

Shot—
25-lb. bag.
Drop, up to B....$1.95
Drop, B and larger....2.20
Buck....2.20
Chilled....2.20
Dust....2.40

Shovels and Spades—
Association list, Nov. 15, 1902..40%

Snow Shovels—
Long Handle....$3.75@$3.00
Wood and Mall, D. Handle....$3.25@$3.50

Sieves and Sifters—
Hunter's Imitation....gro.$9.50@10.00
Hunter's Genuine....per gro. $12.00@12.50
Buffalo Metallic Blued, R. M. Co., ℔ gr.

14&16	16&18	18&20
$13.20	$13.50	$14.40

Sieves, Seamless Metallic
—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in....60%
20 x 40 to 24 x 50 in....50%
24 x 60 to 24 x 120 in....30%
Barnes' low list:
Up to and including 20 x 36 in....50%
20 x 40 to 24 x 50 in....45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron....70@75&10%
Steel....40@45%

Slates, School—
Factory Shipments.
"D" Slates....50@50&10%
Eureka, Unexcelled Noiseless..60&5 tens
Victor A, Noiseless..60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German....40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan....40%
Jockey....25%
Oneida Community:
Harness Snaps, 1 inch....60&5%
Swivel Snaps....60%
Swivels....50%

Snaths—
Scythe....50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality....50&10@60&5%
Cheap....60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton....50&10%
Rogers & Bro., William Rogers' Eagle Brand....50&10%
Anchor, Rogers Brand....60%
Wm. Rogers & Son....60&10%

Miscellaneous—
German Silver....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver....50%

Tinned Iron—
Teas....per gro. 45@50¢
Tables....per gro. $0.50@$1.00

Springs—Door—
Bardsley's Spring and Check....40%
Chicago (Coil)....40&10%
Gem (Coil)....20%
Pullman (Coil)....35%
Reliance (Coil)....40&10%
Star (Coil)....30%
Torrey's Rod, 39 in....℔ doz. $1.10

Carriage, Wagon, &c.—
1¼ in. and Wider: *Per lb*
Black....4@4¼¢
Half Bright....4@4¼¢
Bright....4½@4¾¢
Painted Seat Springs:
1¼ x 2 x 26....per pr. 42¢
1¼ x 3 x 25....per pr. 70¢

Sprinklers, Lawn—
Enterprise....25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20....30%
Pleuger & Henger Mfg. Co.:
Cactus, 65&5%; Japanese, 70&5%; Nationals, 60&5%.

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } *75@—%*
Rosewood Hdl. Try Square and T-Bevels....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels....40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel....15%
Winterbottom's Try and Miter, No. 1, 35%; No. 2....45%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap....doz. $1.00
Good Grade....doz. $1.25
Tinned Iron....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—
Barbed Blind....lb. 6@6½¢
Electricians', Association list..80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized....$2.55
Poultry Netting Staples....per lb. 3½@3¼¢

Steels, Butchers'—
Dick's....30%
Foster Bros.'....30%
C. & A. Hoffmann's....40%

Steelyards—....50@30&10%

Stocks and Dies—
Blacksmiths'....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates....25%
Green River....25%
Lightning Screw Plate....25%
Little Giant....25%
Reece's New Screw Plates....25%

Stoners, Cherry—
Enterprise....25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Oil, Double Grit....65%
Gem Axe, Single or Double Grit..65%
Gem Slips....65%
Gem Razor Hones....50%
Pike Mfg. Co., 1904 list: (33⅓%)

	℔ lb.
Arkansas St. No. 1, 3 to 5¼ in.	$2.80
Arkansas St. No. 1, 5½ to 8 in.	3.50
Arkansas Slips No. 1	4.00
Lily White Washita, 4 to 8 in.	60¢
Rosy Red Washita, 4 to 8 in.	60¢
Washita St., Extra, 4 to 8 in.	50¢
Washita St., No. 1, 4 to 8 in.	40¢
Washita St., No. 2, 4 to 8 in.	30¢
Lily White Slips	90¢
Rosy Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Washita Slips, No. 2	40¢

India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit....33⅓%
Quickcut Emery Rubbing Bricks 33⅓%
Hindostan No. 1, R'g'lar....℔ lb 8¢
Hindostan No. 1, Small....℔ lb 10¢
Axe Stones (all kinds)....33⅓%
Turkey Oil Stones, Extra, 5 to 8 in....℔ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips....40¢
Sand Stone....6¢

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem, ℔ gro., 10 in., $8.00; 12 in., $10.80.
Norton Alundum Scythe Stones:
Less than 10 gross lots... ℔ gro. $6.00
Lots of 10 gross or more...℔ gro, $4.50
Pike Mfg. Co., 1901 list:
Black Diamond S. S...℔ gro. $12.00
Lamoille S. S.....℔ gro. $11.00
White Mountain S. S.℔ gro. $9.00
Green Mountain S. S.℔ gro. $6.00
Extra Indian Pond S.S.℔ gro. $7.50
No. 1 Indian Pond S.S.℔ gro. $7.00
No. 2 Indian Pond S.S.℔ gro. $4.50
Leader Red End S. S.℔ gro. $4.50
Quick Cut Emery....℔ gro. $10.00
Pure Corundum,.....℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....℔ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ℔ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.60
Bullard, ℔ doz.....$4.00
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00.....20%

Woven Fence—

Franklin.....ea, $3.75

Strops, Razor—

Star Diagonal Strop.....25%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....50&5%

Sweepers, Carpet—

	℔ doz.
National Sweeper Co.:	
Louis XV, Roller Bearing, Gold Plated	$120.00
Hepplewhite, Roller Bearing, Silver Plated	$72.00
Sheraton, Roller Bearing, N'kel.	$60.00
Ye Mission, Roller Bearing, Oxidized Coppered	$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled	$36.00
National Queen, Roller Bearing, Fancy Veneers	$27.00
Loyal, Roller Bearing, Veneers, Nickeled	$25.00
Triple Medal, Roller Bearing, Nickeled	$24.00
Marion, Roller Bearing, N'kel.	$24.00
Marion Queen, Roller Bearing, Nickeled	$21.00
Monarch, Roller Bearing, N'kel.	$22.00
Monarch, Roller Bearing, Jap.	$20.00
Perpetual, Regular B'rgs, N'kel.	$20.00
Perpetual, Regular B'rgs, Jap.	$18.00
Monarch Extra (17 in, case), Roller Bearing, Nickeled	$36.00
Monarch Extra (17 in, case), Roller Bearing, Japanned	$33.00
Auditorium (28 in. case), Roller Bearing, Nickeled	$54.00
Mammoth (30 in, case), Roller Bearing, Nickeled	$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:

Eureka Japanned	℔ doz. $15.00
Model E, Sanitaire	℔ doz $25.00
Model A, Sterling	℔ doz. $25.00
Model B, Sterling, Nickeled	℔ doz. $23.00
Model B, Sterling, Japanned	℔ doz. $21.00
Model C, Sterling	℔ doz. $21.50
Model D, Sterling	℔ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks..90&30%
American Cut Tacks.....90&30%
Swedes Cut Tacks.....90&30%
Swedes' Upholsterers'....90&10%
Gimp Tacks.....90&40%
Lace Tacks.....90&40%
Trimmers' Tacks.....90&30%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&40%
Hungarian Nails.....80&20%
Finishing Nails.....70%
Trunk and Clout Nails.....80%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90¢ per 5 lbs

See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, R. M. Co.	30-gal. $3.40
Emerald, R. M. Co.	60-gal. $4.25
Queen City, R. M. Co.	30-gal. $3.65
Queen City, R. M. Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@50&5%
Steel .....33 1-3&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c. 60&10@65%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s, Davidson 25%

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75@75&5%
Newhouse .....40@45&5%
Hawley & Norton.....65%
Victor .....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ℔ doz., $13.25; case of 24 .....$11.50 doz.
No. 3, Rat, ℔ doz., $6.50; case of 50 .....$5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 .....$4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 .....$3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 .....$2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McFarlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....℔ doz. $16.00
Grocery .....℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....℔ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....℔ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized,	$64	$76	$84	$96

10&5%

Galvanized Wash Tubs (R. M. Co.):

No.	1	2	3	10	20	30
Per doz., net.	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ⅛-lb. Balls.23@25¢
No. 12, ¼ and ⅛-lb. Balls.21@22¢
No. 18, ¼ and ⅛-lb. Balls.18@20¢
No. 24, ¼ and ⅛-lb. Balls.17@19¢
No. 36, ¼ and ⅛-lb. Balls.16@18¢
Chalk Line, Cotton ¼-lb. Balls .....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....11@19¢
Cotton Wrapping, 3 Balls to lb., according to quality...15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....14½@15½¢
American 3-Ply Hemp. 1-lb. Balls .....15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).10½@11½¢
India 3-Ply Hemp, 1-lb. Balls .....10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
2, 3, 4 and 5-Ply Jute. ½-lb. Balls .....12½@13½¢
Mason Line, Linen, ½-lb. Bls.47¢
No. 264 Mattress, ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting Adjustable Jaw, 25@25&10%; Solid Jaw, 35@35&10%
Tiger Machinists'.....40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Hollands:
Machinists' .....40@40&5%
Keystone .....65&40&10%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip.....15%
Merrill's 20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Snediker's X. L.....33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, ℔ doz....$4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50

Dia. 15%

Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

	℔ doz.
Solid Zinc:	
Crescent, family size, bent frame.	$3.70
Red Star, family size, stationary protector	$3.70
Double Zinc Surface:	
Saginaw Globe, family size, stationary protector	$3.25
Cable Cross, family size, stationary protector	$3.40
Single Zinc Surface:	
Naiad, family size, open back, perforated	$2.90
Single Saginaw Globe	$2.75
Brass Surface:	
Brass King, Single Surface, open back	$3.65
Nickel Plate Surface:	
No. 1001 Nickel Plate, Single Surface	$3.65
Glass Surface:	
Glass King, Single Surface, open back	$3.65
Enamel Surface:	
Enamel King, Single Surface, ventilated back	$3.65

Washers—Leather, Axle—

Solid .....50&10@80&10&10%
Patent .....90@90&5%

Coil:	*¾*	*1*	*1¼*	*1½ Inch.*
	10¢	*11¢*	*12¢*	*14¢ per box*

Iron or Steel—

Size bolt....	*5-16*	*⅜*	*½*	*⅝*	*¾*
Washers....	*$5.90*	*5.00*	*3.70*	*3.50*	*3.30*

The above prices are based on $5.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co.....30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$30.00
Southern Territory.$23.00@$24.00
Western and Central Districts .....$22.00@$28.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Brass.....24¢ lb., base
Copper .....32¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10@75&10%
Brass and Copper..60&10@65&10%
Retailers' Assortments, per box, $2.25@$2.50

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&10%
Brass Wire Goods.....85&25%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&2½@80&7½%
Painted Screen Cloth, 100 ft., $1.30
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3½¢
Nos. 4 and 5 Mesh, sq. ft. 3½¢
No. 6 Mesh, sq. ft.....3½¢
No. 8 Mesh, sq. ft.....4½¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75@75&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut.....50%
Combination Black.....40&5%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle 70%
Elgin Wrenches, ℔ doz.....$6.25
Elgin Rethreading Attachment, only with one die, ℔ doz.....$6.25
Elgin Extra Dies, ℔ doz.....$3.00
Elgin Extra Jaws, ℔ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ℔ doz.....$2.10
Gem Pocket.....20%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P. S. & W.....50&5%
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 6 gross lots, ℔ gross, $7.50; ℔ doz.....$0.80

Wrought Goods—

Stables, Hooks, &c., list March 17, '02.....87½@87½&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lb., $8.50@$8.75

For the Table of "Current Metal Prices" see the First Issue of Every Month.

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 79: No. 8. *New York, Thursday, February 21, 1907.*

$5.00 a Year, including Postage.
Single Copies, 15 Cents.

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Advertising and Subscription Rates	"	204

FORSTER PULLEY WORKS, Cuba, N. Y.

The American Mfg. Co.
Ropes and Twines
65 Wall Street, New York

THE BRISTOL COMPANY
Waterbury, Conn., U. S. A.
New York: 114 Liberty St.
Chicago: 753 Monadnock Bldg.
Bristol's Recording Instruments
For Pressure, Temperature and Electricity.
Simple, Accurate, Reliable.
All Ranges, Low Prices, and Guaranteed. Send for Catalog R.

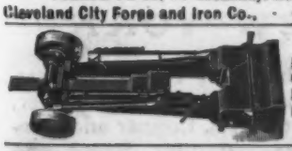
SAMSON SPOT CORD

Also Linen and Italian Hemp Sash Cord

SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES

Branch Office, 11 Broadway, New York.
Cleveland City Forge and Iron Co., Cleveland, O.



IRON ORES.
Pilling & Crane
Girard Building, Phila.
Machesney Bldg., Pittsb'g.
Empire Bldg., New York.

There may be some substitute for

HIGH QUALITY

—but so far it has not been discovered.

See
AMERICAN
SHEET & TIN PLATE
COMPANY'S
Ad. on Page 16

SHOT SHELLS

Arrow and Nitro Club brands were carried by the thousands to the game fields last fall. Their popularity and the partiality of shooters for them is not accidental. True merit in manufacture, from primer to crimp, has won such a confidence in the U. M. C. trade-mark that it means A PREFERENCE.

U. M. C Shells give satisfaction.
Carry a good stock.

The Union Metallic Cartridge Co.,
Bridgeport, Conn.
Agency, 313 Broadway, New York City

WATER TUBE BOILERS
The Babcock & Wilcox Co.
85 Liberty Street
New York
See page 54

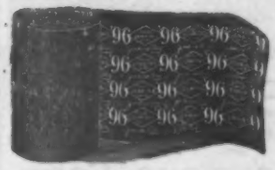
SOLD UNDER this TRADE MARK
"The Best Horseshoe Nails in the World"

"The Capewell"

"The Capewell"

This Trade Mark
Guarantees Satisfaction to all Purchasers

Made by THE CAPEWELL HORSE NAIL COMPANY
HARTFORD, CONN., U. S. A.



Jenkins '96 Packing

is preferred by all engineers who have ever had the opportunity to gain a full knowledge of its merits. It makes perfect joint instantly. It gives longest satisfactory service. It is guaranteed. Write for booklet.
JENKINS BROS., New York, Boston, Philadelphia, Chicago, London.

"Swedoh" Cold Rolled Steel is unexcelled for Drawing and Stamping
THE AMERICAN TUBE & STAMPING COMPANY
(Water and Rail Delivery) Bridgeport, Conn.
SEE PAGE 18.

MAGNOLIA METAL.
Best Anti-Friction Metal for all Machinery Bearing.
Fac-Simile of Bar. Beware of Imitations.

MAGNOLIA METAL CO.
Owners and Sole Manufacturers, Chicago, Fischer Bldg.
113-115 Bank Street, NEW YORK.
San Francisco, Montreal and Pittsburg. We manufacture all grades of Babbitt Metals at competitive prices.

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem, ₱ gro., 10 in., $8.00; 12 in., $10.80.
Norton Alundum Scythe Stones:
Less than 10 gross lots... ₱ gro. $6.00
Lots of 10 gross or more..₱ gro. $4.50
Pike Mfg. Co., 1901 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S.₱ gro. $9.00
Green Mountain S. S.₱ gro. $6.00
Extra Indian Pond S.S.₱ gro. $7.50
No. 1 Indian Pond S.S.₱ gro. $7.00
No. 2 Indian Pond S.S.₱ gro. $4.50
Leader Red End S. S.₱ gro. $4.50
Quick Cut Emery....₱ gro. $10.00
Pure Corundum.....₱ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓% } 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.00
Bullard, ₱ doz.....$4.00
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....20%

Woven Fence—

Franklin.....ea, $3.75

Strops, Razor—

Star Diagonal Strop.....25%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....30&5%

Sweepers, Carpet—

National Sweeper Co.: ₱ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled $21.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Eureka Japanned.....₱ doz. $15.00
Model E, Sanitaire.....₱ doz $25.00
Model A, Sterling.....₱ doz. $25.00
Model B, Sterling, Nickeled.....
₱ doz. $23.00
Model B, Sterling, Japanned.....
₱ doz. $21.00
Model C, Sterling.....₱ doz. $21.50
Model D, Sterling.....₱ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks..90@30%
American Cut Tacks.....90@30%
Swedes Cut Tacks.....90@30%
Swedes' Upholsterers'....90@40%
Gimp Tacks.....90@40%
Lace Tacks.....90@40%
Trimmers' Tacks.....90@30%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90@40%
Hungarian Nails.....80@20%
Finishing Nails.....70%
Trunk and Clout Nails.....80%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10@5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90c½ or 5 tens

See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, R. M. Co.	30-gal. $3.40
Emerald, R. M. Co.	60-gal. $4.25
Queen City, R. M. Co.	30-gal. $3.65
Queen City, R. M. Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel .....33 1-3&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10&50%
Favorite, Duck and Leather.....
25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c.60&10@65%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s, Davidson 25%

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....35%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

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Mouse, Round or Square Wire, doz. 85@90¢
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No. 3, Rat, ₱ doz., $6.50; case of 50 .....$5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 .....$4.70 doz.
No. 4, Mouse, ₱ doz. $3.85; case of 150 .....$3.00 doz.
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Daisy Stove Trucks, Improved Pattern .....₱ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized, $6½ $76 $8½ $96 10&5%
Galvanized Wash Tubs (H. M. Co.):
No. 1 2 3 10 20 30
Per doz., net.$5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls.23@25¢
No. 12, ¼ and ½-lb. Balls.21@22¢
No. 18, ¼ and ½-lb. Balls.18@20¢
No. 24, ¼ and ½-lb. Balls.17@19¢
No. 36, ¼ and ½-lb. Balls.16@18¢
Chalk Line, Cotton ½-lb. Balls .....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality...15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....14½@15½¢
American 3-Ply Hemp, 1-lb. Balls .....15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).10½@11½¢
India 3-Ply Hemp, 1-lb. Balls .....10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
2, 3, 4 and 5-Ply Jute. ½-lb. Balls .....12½@13½¢
Mason Line, Linen, ½-lb. Bls.47¢
No. 26½ Mattress, ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50&10%
Parallel—
Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting, Adjustable Jaw, 2@25&10%; Solid Jaw, 35@35&10%
Tiger Machinists'.....40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Hollands':
Machinists' .....10@40&5%
Keystone .....65&60&70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip.....15%
Merrill's 20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Snediker's X. L.....33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, ₱ doz....$4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.*

B. E., 11 up	*60¢*	Dis. 15%
B. E., 9 and 10	*70¢*	
B. E., 8	*80¢*	
B. E., 7	*80¢*	
P. E., 11 up	*$1.00*	
P. E., 9 and 10	*1.25*	
P. E., 8	*1.50*	
P. E., 7	*1.50*	

Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—
Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$3.70
Red Star, family size, stationary protector $3.70
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$3.25
Cable Cross, family size, stationary protector.....$3.40
Single Zinc Surface:
Naiad, family size, open back, perforated $2.90
Single Saginaw Globe.....$2.75
Brass Surface:
Brass King, Single Surface, open back $3.65
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.65
Glass Surface:
Glass King, Single Surface, open back $3.65
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.65

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅛ 1 1¼ 1½ Inch.
10¢ 11¢ 12¢ 14¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—
Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co.....30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$30.00
Southern Territory.$23.00@$24.00
Western and Central Districts .....$22.00@$28.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Brass.....24¢ lb., base
Copper .....32¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10@75&10%
Brass and Copper..60&10@65&10%
Retailers' Assortments, per box, $2.25@$2.50

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&10%
Brass Wire Goods.....85&25%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&2½@80&7½%
Painted Screen Cloth, 100 ft., $1.30
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3¼¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft.....3¾¢
No. 8 Mesh, sq. ft.....4¼¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75@75&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut.....50%
Combination Black.....40&5%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle 70%
Elgin Wrenches, ₱ doz.....$6.25
Elgin Rethreading Attachment, only with one die, ₱ doz.....$6.25
Elgin Extra Dies, ₱ doz.....$3.00
Elgin Extra Jaws, ₱ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz.....$2.10
Gem Pocket.....30%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W.....50&5%
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz.....$0.80

Wrought Goods—

Stables, Hooks, &c., list March 17, '92.....87½@87½&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lb., $8.50@$8.75